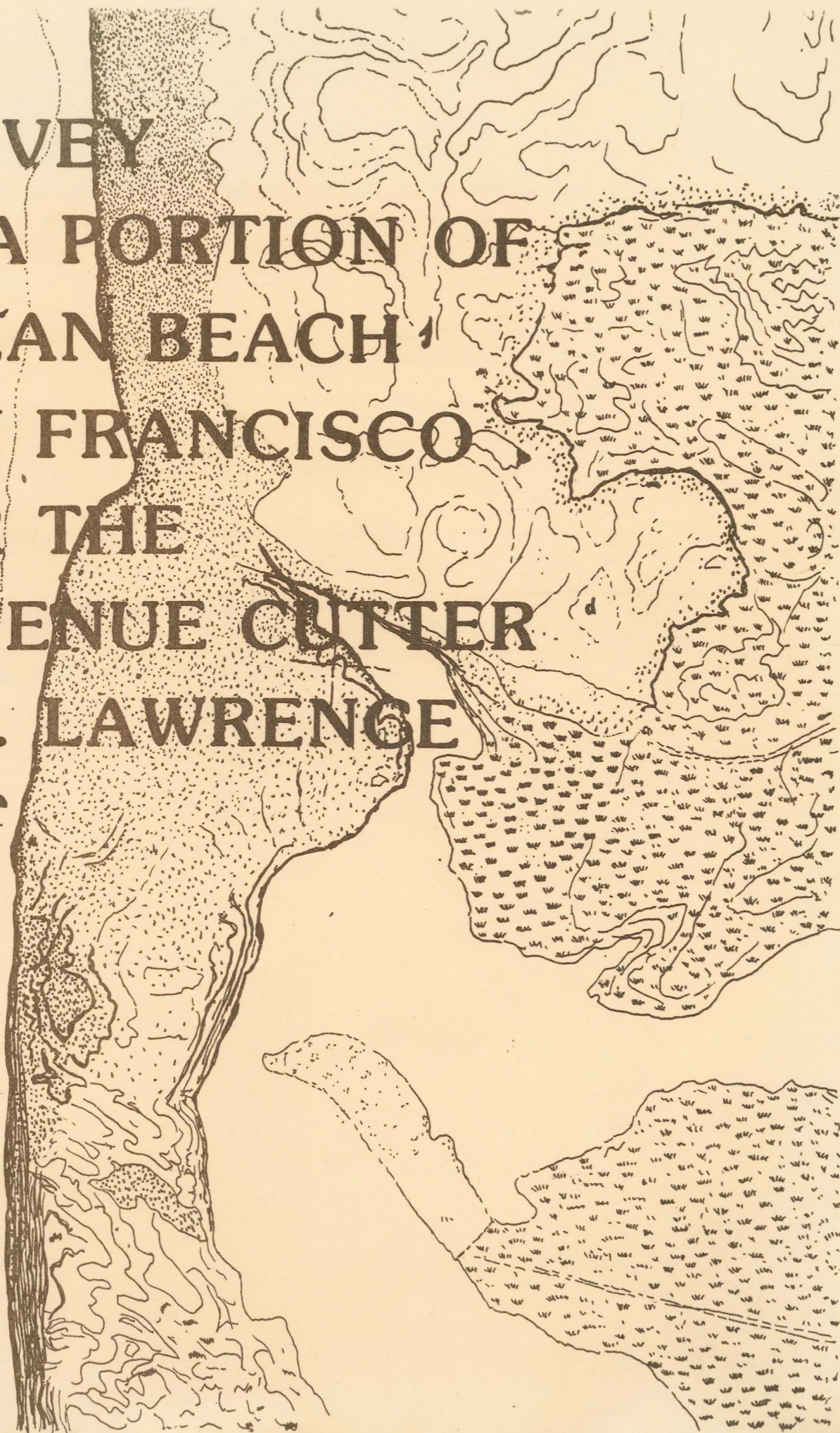


**SURVEY
OF A PORTION OF
OCEAN BEACH
SAN FRANCISCO
FOR THE
REVENUE CUTTER
C.W. LAWRENCE**

Wreck



NUMBER TWO IN THE GOLDEN GATE NATIONAL RECREATION AREA
MARITIME ARCHEOLOGICAL PUBLICATION SERIES

1. Preliminary Documentation and Identification of the Remains of the 1882 Schooner Neptune (1982)
2. Shipwreck Survey of a Portion of Ocean Beach...To Locate the United States Revenue Cutter C W. Lawrence (1984)
3. Preliminary Documentation of the 1856 Ship King Philip (In Press)
4. Archeological Investigation of the 1848 Sidewheel Steamship Tennessee (In Press)
5. Shipwreck Overview of the Golden Gate National Recreation Area (In Press)
6. Preliminary Documentation of the 1875 Steamship City of New York (In Press)

SHIPWRECK SURVEY OF A PORTION OF OCEAN BEACH
GOLDEN GATE NATIONAL RECREATION AREA
SAN FRANCISCO, CALIFORNIA

TO LOCATE

THE REMAINS OF THE UNITED STATES REVENUE
CUTTER C.W. LAWRENCE

James P. Delgado
Larry Murphy
Roger E. Kelly, Ph.D.

United States Department of the Interior
National Park Service
Golden Gate National Recreation Area
San Francisco, California



San Francisco
February 1984

RESEARCH SURVEY OF A PORTION OF OCEAN BEACH
GOLDEN GATE NATIONAL RECREATION AREA
SAN FRANCISCO, CALIFORNIA

TO LOCATE

THE REMAINS OF THE UNITED STATES STEAMER
CUTTER C.W. LAWRENCE

James V. Delgado
Larry Murphy
Roger E. Kelly, P.E.

United States Department of the Interior
National Park Service
Golden Gate National Recreation Area
San Francisco, California

San Francisco
February 1984

TABLE OF CONTENTS

INTRODUCTION	1
HISTORICAL BACKGROUND.....	5
Construction of Lawrence.....	5
Voyage to California.....	8
On Station at San Francisco.....	12
Coastal Surveillance.....	15
Wreck of Lawrence.....	19
OTHER VESSELS IN SURVEY AREA.....	23
Aimer.....	23
William L. Beebe.....	23
INTRUSIVE FEATURES.....	25
Fleishhacker Pool Intake.....	25
Southwest Ocean Outfall.....	25
Stranding of Betty L.....	25
DETERMINING LAWRENCE REMAINS.....	27
SELECTION OF STUDY AREA.....	30
SURVEY DESIGN.....	34
SURVEY METHODOLOGY.....	37
SURVEY RESULTS.....	38
RECOMMENDATIONS.....	40
CONCLUSION.....	41
REFERENCES CITED.....	42

APPENDICES.....45

I. Specifications for Six Schooners for the U.S. Revenue Service...1848.....	45
II. Armament.....	49
III. Specifications for Rations, 1849.....	50
IV. Launching Ships at Easby's Shipyard in the 1840s.....	51

ILLUSTRATIONS

Figure 1: Location of Study Area in the San Francisco Bay Area and California.....	3
Figure 2: Voyage of Lawrence to San Francisco, 1848-1849, and Voyage to San Diego and Honolulu, 1851.....	11
Figure 3: Wreck of Lawrence.....	21
Figure 4: 1852 Coast Survey Chart.....	32
Figure 5: Study Area, Showing Base line, Vessel Tracks and Anomaly Buoys.....	39

INTRODUCTION

The genesis of research and a systematic search for remains of the Revenue Cutter C.W. Lawrence came from the interest of the Nautical Heritage Museum at Dana Point, Calif., and the cultural resource management plans of the Golden Gate National Recreation Area. The Heritage Museum is sponsoring a replica sailing vessel, modeled after Lawrence, to be christened Californian and used to provide training and experience for young citizens of the state. The location of physical remains of Lawrence would benefit the Heritage Museum's programs and augment knowledge of the resource for the Golden Gate National Recreation Area for more effective management. In addition, Lawrence and her sister ships comprised the forerunner agency of the present United States Coast Guard, and Lawrence was the first revenue cutter assigned to the Pacific Coast during the gold rush years. As a result, the project was also of interest to the United States Coast Guard, which provided operational assistance. This report summarizes the first phase of historical research and field work within the Golden Gate National Recreation Area for remains of Lawrence.

Acknowledgements

Sincere appreciation is extended to the following persons for their respective contributions to this project. It should be noted that the personnel involved represented military, civilian and private organizations, and citizen volunteers of the National Park Service. A donation of \$2,400 from the Nautical Heritage Museum enabled the National Park Service to undertake this work. Larry Murphy, archeologist with the Service's Submerged Cultural Resources Unit, was detailed for this project.

Nautical Heritage Museum:

Steve G. Christman
W. Edward Naugler Jr.
Jon L. Olson
Howard A. Siegal

United States Coast Guard, Headquarters, Washington, D.C.

Petty Officer Michael Grubb
Master Chief William Wells

United States Coast Guard, 12th District

Admiral C.E. Larkin and officers
Lt. Cindy Coogan
Lt. Stephen Toney

National Park Service Volunteers in Parks:

Lawrence Tew, M.D.
Fred Boeck

State of California Lands Commission:

Leslie H. Grimes
Joyce Lane

Columbia Historical Society, Washington, D.C.

Elizabeth J. Miller

National Park Service, Golden Gate National Recreation Area

G. Douglass Nadeau
Ginger Muldoon

National Park Service, Southwest Regional Office, Submerged Cultural
Resources Unit

Daniel J. Lenihan

Technical Editing - Joy Murphy

Personnel and Operations in Field

Park Project Coordinator:
James P. Delgado

Regional Office Coordination:
Roger E. Kelly, Ph.D.

Optical Positioning:
Martin T. Mayer
Fred Boeck

Remote Sensing:
Larry Murphy

U.S. Coast Guard Crew: Utility Boat 41393
EM2 Gregory Gordon, Coxswain
S. Tracey Brown
EM2 Lisa McDade

Photography:
PA2 Ron Cabral USCGR
Lawrence Tew, M.D.

Field work was performed during Oct. 26, 27 and 28, 1983. A total of 8 hours were spent on board U.S. Coast Guard vessel UB 41393 magnetically surveying offshore and 20 hours onshore within the study area. A 45-minute one-way trip from the Coast Guard Base at Yerba Buena Island to the project area, heavy fog conditions and 5-to-8-foot ocean swells severely reduced effective time for survey. These conditions also prevented divers from evaluating anomalies recorded within the study area.

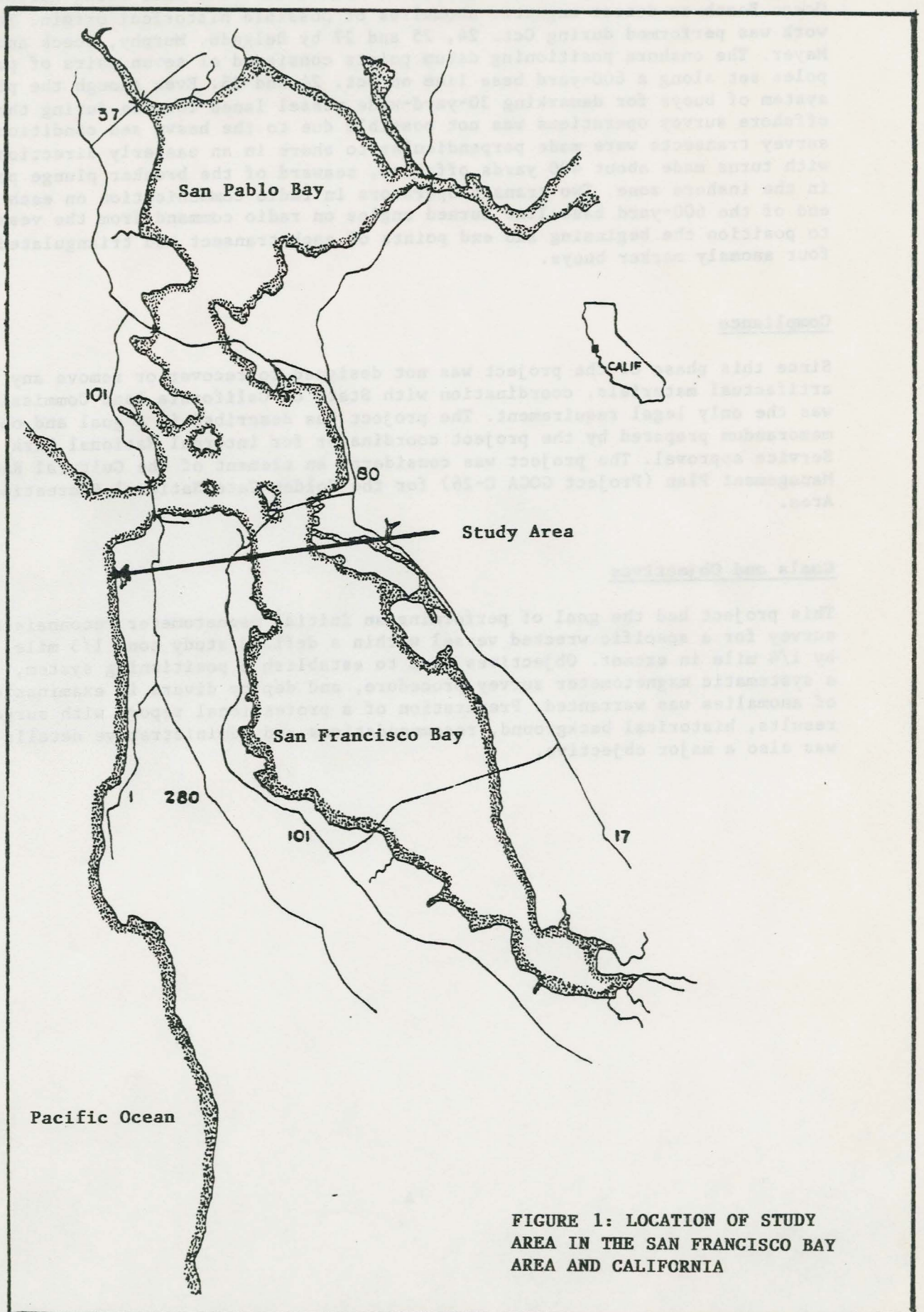


FIGURE 1: LOCATION OF STUDY AREA IN THE SAN FRANCISCO BAY AREA AND CALIFORNIA

Onshore, several 2-foot-long magnetometer traverses were made along narrow Ocean Beach to detect magnetic anomalies of possible historical origin. This work was performed during Oct. 24, 25 and 27 by Delgado, Murphy, Boeck and Mayer. The onshore positioning datum points consisted of seven pairs of painted range poles set along a 600-yard base line on Oct. 24 and 25. Even though the planned system of buoys for demarking 30-yard-wide vessel lanes for use during the offshore survey operations was not possible due to the heavy sea conditions, survey transects were made perpendicular to shore in an easterly direction, with turns made about 400 yards offshore, seaward of the breaker plunge point in the inshore zone. Two transit operators in radio communication on each end of the 600-yard base line turned angles on radio command from the vessel to position the beginning and end points of each transect and triangulated four anomaly marker buoys.

Compliance

Since this phase of the project was not designed to recover or remove any artifactual materials, coordination with State of California Land Commission was the only legal requirement. The project was described in a goal and objectives memorandum prepared by the project coordinator for internal National Park Service approval. The project was considered an element of the Cultural Resources Management Plan (Project GOGA C-26) for the Golden Gate National Recreation Area.

Goals and Objectives

This project had the goal of performing an initial magnetometer reconnaissance survey for a specific wrecked vessel within a defined study zone 1/3 mile by 1/4 mile in extent. Objectives were to establish a positioning system, a systematic magnetometer survey procedure, and deploy divers if examination of anomalies was warranted. Preparation of a professional report with survey results, historical background, recommendations and administrative details was also a major objective.

HISTORICAL BACKGROUND

The discovery of gold in California and the resultant mass migration to the Western shore of the continent in 1849 brought hundreds of vessels into the Pacific. Many ships carrying passengers and freight intended for the "gold diggings" made their way to San Francisco, the gateway to the California mines. In addition to the hundreds of vessels engaged in the rush for gold were scores of ships from domestic and foreign ports that carried on an active and diverse trade with the rapidly developing new territory (Rasmussen 1967). Isolated from the rest of the nation by the vastness of the continent, and lacking industrial and agricultural development, California thrived on this trade. The bulk of trade was also a financial boon to the United States, which had acquired California in 1848 as a result of the Mexican War. The active maritime trade meant a substantial collection of duties on imported goods and merchandise. Congress, eager to collect the revenue generated by California's gold rush trade, and also eager to establish and maintain American laws and regulations in the young territory, responded by appointing Col. James Collier collector of customs for California, granting him the power to establish collection districts, enforce customs laws, regulate foreign trade and collect revenue. Collier arrived in San Francisco in early November of 1849 and eagerly entered into his new duties (Foreman 1937 and Harlow 1982).

To assist the new collector in enforcing the regulations governing customs and the collection of revenue a vessel was detailed from the ranks of the United States Revenue Marine. The Revenue Marine, created in 1790 by Secretary of the Treasury Alexander Hamilton, performed duties other than the enforcement of revenue laws. Throughout its history the service engaged in aiding vessels in distress, in life-saving and salvage, the suppression of the slave trade and piracy, the carrying of government diplomats and dispatches, and assisting the Navy in wartime, "all with their many incidental adventures" (Chappelle 1935:176). In 1844 the Revenue Marine, which had been plagued with interference and misdirection by political appointees, was professionalized by the appointment of Capt. Alexander V. Fraser, an officer from the ranks, as commandant. Fraser had control of personnel, promotion and discipline in the Revenue Marine. Unfortunately, the various cutters were also subject to the command of the collectors of the ports at which they were stationed (Chappelle 1935:210-211). The collectors were political appointees, and instances of interference still occurred, leading to friction between the commandant and some collectors. This friction in four years' time would lead to Fraser's removal and reassignment.

Construction of Lawrence

In 1848 seven new cutters were ordered for the Revenue Marine, which had suffered substantial losses of vessels in the Mexican War of 1846-1848. One of the new cutters was C.W. Lawrence, built at Washington, D.C., in 1848 by William Easby. Easby, a native of Yorkshire, England, had been raised in the United States, learning the practice of shipwrightery in the Washington Navy Yard where he ultimately rose to the position of Master Builder. Easby resigned in 1829 and within the next year had opened his own shipyard at Foggy Bottom * (Easby-Smith 1913:passim).

* The site is now occupied by the John F. Kennedy Center for the Performing Arts and the Watergate Apartments (Froncek, 1977:167-168)

Easby had previously launched another Revenue cutter, Walter Forward, in 1841. Lawrence was probably laid down in late 1847 or early 1848. The first mention of the ship appears in Revenue Marine correspondence in December of 1847 and is an order to Messrs. Kirby & Whittington, sailmakers in Baltimore, for "sails, Awning, Bags, Hammocks, Hammock cloths, Tarpaulins &c for the new Revenue Brig...have them ready for shipment to this City on or before the first day of May next" (Young to Kirby & Whittington, Dec. 14, 1847). Construction was well along by April, when an order was placed with the Navy Yard at Norfolk, Va. to construct "Hardy" gun carriages for two light 32-lb. cannon, to be delivered to the Washington Navy Yard. At the same time small arms and edged weapons were being requisitioned for Lawrence from the Custom House storehouse in New York (Young to Booth, April 28, 1848). On the same date 12 Model 1848 repeating pistols were ordered from Samuel Colt, to be issued to Lawrence (Young to Colt, April 28, 1848). In July the heavier armament was ready to be placed on the ship; a letter to Revenue Marine officials at Norfolk instructed them

...without any delay, ship to this place, to be delivered at the shipyard of Mr. Easby, the two guns, carriages and appurtenances, now at the Navy Yard at Norfolk and which are intended for the revenue brig now in course of construction in this city (Walker to Evans, July 28, 1848)

To arm the guns, shot, shells and canisters were requisitioned from the Custom House storehouse in New York, the Washington Navy Yard, and the War Department's Ordnance Bureau (Walker to Chaddock, July 31, 1848; Walker to Mason, Aug. 15, 1848; and Young to Talcott, Sept. 5, 1848). The nearly complete state of the vessel also compelled the Revenue Marine to order the harness cask, scuttlebutt, deck buckets, spit boxes and mess kits for Lawrence. They were furnished by George Evans of Baltimore, who was paid \$96.50 for his work (Walker to Collector of Customs, Baltimore, July 11, 1848 and Aug. 3, 1848).

The new cutter, as of yet unchristened, was launched on Aug. 20, 1848. The vessel was quick to join "the element for which she was destined."

Scarcely had some of her blocks been knocked away, when she began, at first imperceptibly, to slide down her slippery ways, and Capt. Fraser and his lady, to whom was assigned the honor of christening the vessel, could scarcely, with all his exertion, find time to leap upon her deck before she plunged into the bosom of the Potomac....She was launched with all her masts and rigging on board, and with colors flying from every elevated point of the vessel (Daily National Intelligencer, Aug. 21, 1848)

The vessel was christened Cornelius W. Lawrence, for the collector of customs at New York. Fraser, relieved as commandant of the Revenue Marine, was to command the new ship on her voyage to the Pacific coast, where she was to be the first Revenue Marine cutter to journey to California, which had only recently been conquered during the war with Mexico. Fraser's new appointment was hailed by the Washington Daily National Intelligencer:

...we have no apprehension that under his auspices she will double Cape Horn without danger, and successfully assist in collecting the customs of the new and admirable ports which we have acquired....

Much work was needed before Lawrence would be ready for sea. Outfitting continued through September of 1848; typical of the work was the installation of carpets and oil cloth furnished by David Clagell & Co. of Baltimore and the purchase of wardroom crockery from C.W. Boteler of the same city (Young to Collector of Customs, Baltimore, Sept. 11, 1848 and Sept. 12, 1848).

Lawrence was built along the lines of the earlier "Baltimore Clippers." While specifications are not available for her, it is felt that she probably closely conformed to specifications for cutters that were issued by the Treasury Department two weeks after her launch (see Appendix I). She was probably built of white oak, live oak, yellow pine, cedar, locust and mahogany, copper-fastened and copper-sheathed. A reporter visited Lawrence after her launch and described her as a "full-rigged" brig.

The Lawrence is pierced for ten guns; she carries five--one long 18-pounder, two medium 32's, and two 6's. Her tonnage is 244 [sic]*; she measures 96½ feet, and 24 feet beam on deck. Her cabin is handsomely fitted up, and the wardroom is almost equally handsome.

According to the officers quoted in the account, "a handsomer vessel, of the same size and tonnage, has rarely ever been constructed" (Daily National Intelligencer, Oct. 30, 1848). Work had progressed sufficiently for the Revenue Marine to take formal possession on Oct. 11. At 3 p.m. the steam tug Salem took Lawrence in tow to the Navy Yard where she was tied up by her crew.

Lawrence was fitted out with more supplies between the 12th and 21st of October; between the 18th and 19th she was painted black. Copper trunks (used as powder magazines) mess pans, kits and buckets, coffee pots, scales, blocks, marlin spikes, spikes, shackle and slice bars, reefing irons, expenditure books for the warrant officer, rockets and flares and boarding pikes were among the items loaded. Chafing mats were woven on Oct. 25, wardroom and cabin supplies were received and stowed on the 27th. The work proceeded without incident:

It was gratifying to witness the admirable order that prevails all over the vessel, and especially so to notice the cheerful hilarity of the sailors between decks, as they sat enjoying a comfortable and substantial meal of hot coffee, beef, and bread (Daily National Intelligencer, Oct. 30, 1848)

On Nov. 1, with the Secretary of Treasury on board to start the journey off in style, Lawrence weighed anchor and was taken in tow by Salem. Stopping at Alexandria, Va. to drop off the Secretary, Lawrence proceeded under sail into Chesapeake Bay, bound for Norfolk, where she would take on additional supplies.

*Presumed to mean 144 tons, a more reasonable figure for a vessel of those dimensions. The 1851 revenue cutter Joseph Lane (100.4 x 23.0 x 8.8) is listed by Chappelle (1935) as being 153.3 tons.

Lawrence arrived at Norfolk on Nov. 6. Supplies loaded there included holystones, barrels of beef and pork, pilot bread, coal, oakum, red chalk, paint, nails, screws, white lead, saws, sponges, an anvil, tin cans (with tops), pump leather, and borax along with many other miscellaneous items. A more important commodity was loaded on Nov. 11: "At 1 p.m. put out the fires, and took on board from the Naval Magazine 1,825 lbs. Powder. At 3 p.m. the powder stowed. Started the fires" (Logbook, Nov. 11, 1848). On Oct. 12, 500 gallons of water were taken on board and Lawrence was towed into the stream by the tug Star. She remained at anchor off Hampton Roads until the 15th (during which time one man deserted) when the pilot was discharged, the anchors stowed, and fore and main gaffs were lowered, a new trysail was set and Lawrence embarked on her voyage to the Pacific. The Gulf Stream was entered on the 17th as Lawrence followed the coast south. Fraser's replacement as commandant of the Revenue Marine, Richard Evans, reported that the will of Congress had been fulfilled with the construction and sailing of Lawrence "under the law making an appropriation for that purpose, Approved Aug. 10, 1846." The new cutter was noted as being of great importance and necessity; she would fulfill her mission because of Fraser's "ability and diligence in the performance of his duties" (House Ex.Doc. 52). Fraser's diligence and sense of duty would conflict with that of his officers and men on the voyage, however. Apparently the political spoils system plaguing the Revenue Marine that Fraser had battled as commandant presented him with officers less experienced than they should have been. In fairness, though, it should also be noted that Fraser was a hard taskmaster.

Voyage to California

Lawrence encountered fierce storms within a week of entering the Gulf Stream. Her departure late in the year would exact a heavy toll, and almost a year would pass before she reached San Francisco. The voyage was nearly "epic." Later histories would comment on the trials of Captain Fraser and Lawrence: "Never was a voyage more plagued by manmade and natural woes" (Bloomfield 1966:50). For more than a month Lawrence faced squally weather, strong currents and damage to her boats and rigging. The conditions brought Fraser's temper, and at times his sharp tongue, into play. Weary from standing watch through the many storms, and finding the men on deck too noisy while he rested, he noted in the log

As a particular favor, it is requested that at least until the arrival of the vessel at Rio the duty shall be carried on quietly. Having felt scarcely any relief from the cares of the deck during this passage, it is absolutely necessary that I should obtain that rest which it appears predetermined to deprive me (Logbook, Dec. 22, 1848)

Land was finally sighted on Jan. 16, 1849 and the following day Lawrence was anchored at Rio de Janeiro. Fraser would later come to regret having ever stopped as slow shore-side repairs delayed the voyage for almost two months. After consultation with the carpenter, the damaged spars, rigging and topmasts were removed, beginning with the booms, gaffs and running rigging on Jan. 20. Lawrence was towed into the Brazilian Navy Dockyard on the 24th, where her chain plates were cut out and the standing rigging unrove. Blacksmiths and carpenters in the dockyard "altered" the rigging for the next few weeks. The nature of the "alterations" is unknown. The work may have involved reinforcing and strengthening Lawrence for the stormy Cape Horn passage.

While work on the rig continued, additional construction was also done. Joiners fitted bookshelves and drawers in the cabin while carpenters renewed stanchions and the fiferails in February. Below the water line, copper sheathing was removed and leaky seams recaulked. By Feb. 26 the work was near completion. The crew scraped pitch from the deck, which had also apparently been recaulked, slushed the masts, and "135 pigs of kentledge" (scrap iron) was added as ballast to increase the ship's stability. On March 7 Lawrence weighed anchor and stood out of the Navy Yard. Anchoring in the harbor for another two-week period, Lawrence was repainted, cleaned and provisioned. On March 21 Lawrence cleared the harbor and stood for sea, heading south to Cape Horn after nearly two frustrating months of detention at Rio.

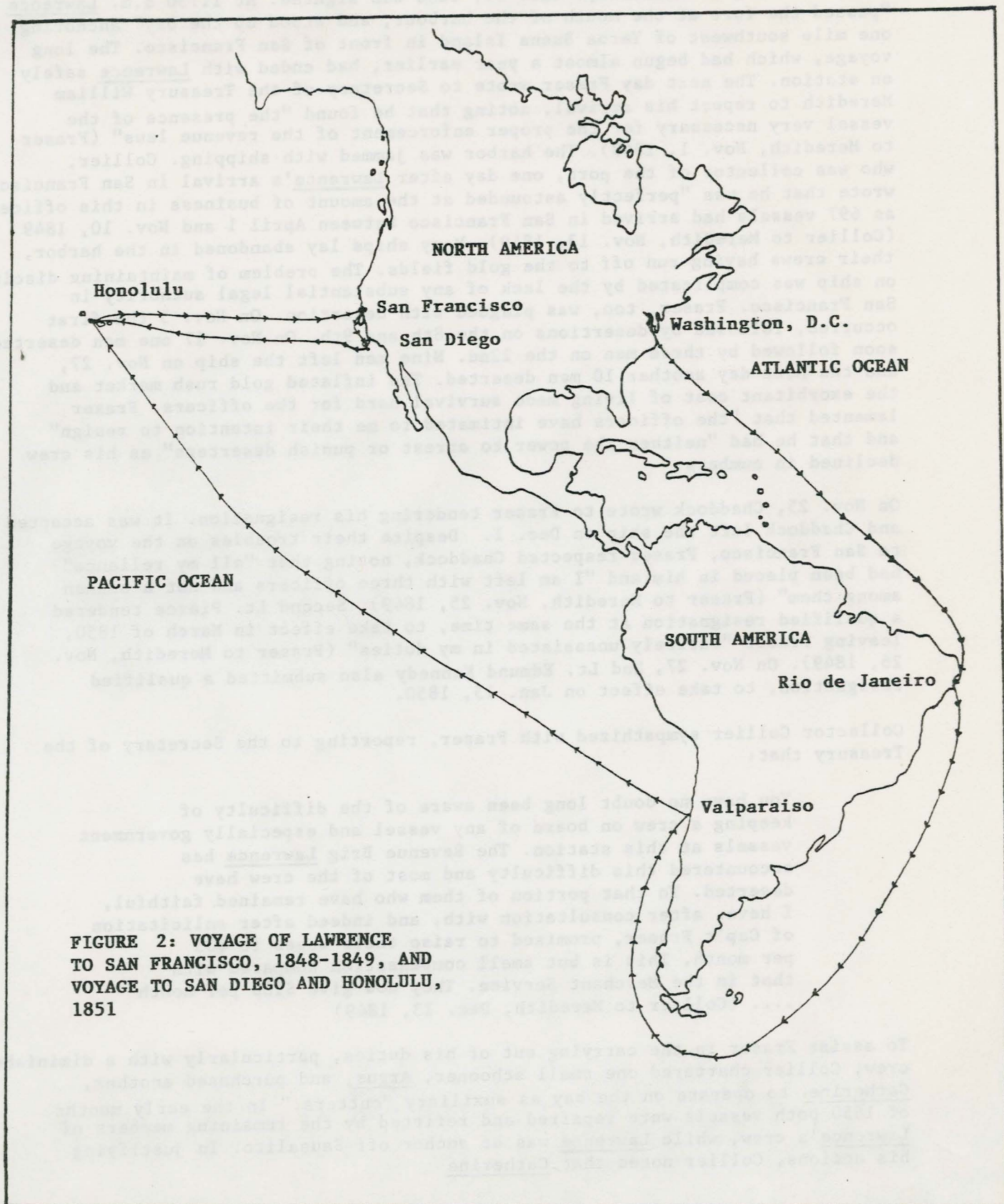
More fierce weather awaited Lawrence at Cape Horn. For more than five weeks Lawrence tacked across the stormy passage, at times sighting the Horn before being blown back. Finally entering the Pacific, Lawrence sailed north, arriving at Valparaiso on June 20, 1849. The crew cleaned themselves and began to scrub down the ship on June 22. The rigging was overhauled, the hold broken out, provisions surveyed, and on July 10 and 11 the ship was painted. The storm-plagued passage evidently had begun to affect the temperament of the officers and men, for soon after their arrival in Valparaiso, troubles arose. Fraser chastised his officers for leaving the ship on indeterminate liberties, demanding that "some requisite period" be fixed for return, and reminding them that "When the government pays a stipulated salary it is supposed that all of the time and energies of the officers are at its disposal...relaxation from duty is to be considered a privilege and not an inherent right" (Fraser to Chaddock, July 1, 1849). Clearly a martinet, Fraser's patience was tested by his young and inexperienced officers, and by voyage's end he would be at odds with most.

Trouble with some of the men also cropped up. On more than one occasion seamen were absent without leave from Lawrence, not returning at the end of their liberty. On July 12, the boatswain returned in a drunken state and began to quarrel with the officer on deck. When ordered to his room, he refused, "using the most insubordinate and insulting language--was then called on deck by the Capt. and to him used similar language." He was sent ashore in a boat to sober up before punishment. Two men deserted while at Valparaiso, and four men were sent ashore sick, further diminishing the ship's company. Six new men were shipped at Valparaiso on July 17th. At 8:30 a.m. on July 19 Lawrence cleared port. Heading away from the coast and out into the Pacific, Fraser knew that soon Lawrence would be on station at San Francisco where she would be busy enforcing the law. On July 25 he informed his officers of their duties, perhaps disdainfully, noting that "upon the Atlantic Coast so little attention has of late years been paid to the legitimate duties of the service that the officers have enjoyed little less than synecures" (Fraser to Chaddock, July 25, 1849). Noting that advice and regulations "has been and will be cheerfully afforded by the Commander," Fraser warned his officers that in San Francisco "a vigilant guard is required and expected by the Department, and officers will no doubt be called upon to act promptly in the discharge of their duties...." In a separate communication Fraser continued to inform the officers of their duty, ordering that a strict lookout be maintained, both day and night. Fraser was apparently angered at the thought of reminding the men of their duties, and on July 28 lashed out, noting "whenever the established and printed regulations of this service proscribe the duties of an officer, special orders upon the subject are unnecessary, and if neglected deserving of censure" (Fraser to Chaddock, July 28, 1849).

Lawrence entered into her new duties before reaching a new landfall. On Aug. 9 the barque La Grange hailed Lawrence off the coast of Peru. La Grange, 140 days out of Salem, Mass., was enroute to California and "in want of coal." At 2:45 p.m. Lawrence hove to and furnished six bags and by 3:00 "filled away and made all sail" (Logbook, Aug. 9, 1849). La Grange arrived in San Francisco on Sept. 2, 1849, made her way upriver to Sacramento, and was eventually converted into a floating jail for the newly formed city of Sacramento. In the 1860s the rotten hulk sank at her moorings, where she still remains, entombed in the mud. After speaking La Grange, Lawrence continued out into the Pacific, bound for the Hawaiian Islands. Difficulty between the captain and his officers persisted. On Aug. 17 Fraser noted in the ship's log that the barometer had not been attended to: "Mr. Chaddock will either attend to this, which has frequently been represented as an important duty, personally by looking at the glass Barometer, or in a manly manner refuse to perform it and take the responsibility."

On Sept. 2, "the island of Owhyee" was sighted. Oahu was reached on the 3rd, and at 4 p.m. Lawrence passed Diamond Head, anchoring 3 miles from Honolulu. The next morning Lawrence was "towed by the natives" into the harbor, anchoring at 9:30 a.m. For the next three weeks the ship was again cleaned and overhauled for the last leg of the voyage to San Francisco, wjoe Fraser delivered important dispatches from Washington to local officials. On Sept. 15, the log noted that Fraser "hoisted our colors half-mast, in memory of James K. Polk (ex-president)" after receiving news of Polk's death. Dissension between Fraser and his officers again flared in Honolulu after Fraser offered a passage to San Francisco to a respected local mariner, one Capt. Swain. Noting that Swain could "swing a cot" in the officers' wardroom, Fraser asked if there would be any objections. The officers objected, apparently much to Fraser's surprise and chagrin. In an angry response, Fraser termed the refusal, "particularly in this case to a respectable shipmaster," a flagrant violation of their duties and a "designed insult," noting that he would pass the refusal on to Swain, along with the names of the offending officers, in hopes that Swain would publish it in the local paper (Fraser to Chaddock, Oct. 24, 1849).

Seventeen Hawaiian islanders were shipped as additional crew members, and on Sept. 28 Lawrence weighed anchor and cleared the harbor. On Oct. 1, Fraser again took up the issue of Capt. Swain. Chaddock, replying for his fellow officers, noted that the objection to Swain had been raised because he was not "in the employ of the Government in any capacity but merely seeking a passage to the coast for his own purposes" (Chaddock to Fraser, Oct. 1, 1849). Fraser closed the argument by noting that in the future "communications on like subjects will be issued in the shape of orders and not as requests" (Fraser to Chaddock, Oct. 1, 1849). On Oct. 20, as Lawrence neared the California coast, Fraser once again chided the officers, noting that they had neglected their duty to provide him with a report of the vessel's position every day despite the prsence of "two sextants, several quadrants...and a nautical almanac." The characteristics of the ship's three chronometers were also listed, along with the ship's plotted position at that moment.



**FIGURE 2: VOYAGE OF LAWRENCE
TO SAN FRANCISCO, 1848-1849, AND
VOYAGE TO SAN DIEGO AND HONOLULU,
1851**

On Station at San Francisco

On the morning of Wednesday, Oct. 31, land was sighted. At 11:30 a.m. Lawrence "passed the fort at the mouth of the harbour, and stood up the bay" anchoring one mile southwest of Yerba Buena Island in front of San Francisco. The long voyage, which had begun almost a year earlier, had ended with Lawrence safely on station. The next day Fraser wrote to Secretary of the Treasury William Meredith to report his arrival, noting that he found "the presence of the vessel very necessary for the proper enforcement of the revenue laws" (Fraser to Meredith, Nov. 1, 1849). The harbor was jammed with shipping. Collier, who was collector of the port, one day after Lawrence's arrival in San Francisco, wrote that he was "perfectly astounded at the amount of business in this office as 697 vessels had arrived in San Francisco between April 1 and Nov. 10, 1849 (Collier to Meredith, Nov. 13, 1849). Many ships lay abandoned in the harbor, their crews having run off to the gold fields. The problem of maintaining discipline on ship was complicated by the lack of any substantial legal authority in San Francisco. Fraser, too, was plagued with desertion. On Nov. 5 the first occurred, followed by desertions on the 8th and 9th. On Nov. 17 one man deserted, soon followed by three men on the 22nd. Nine men left the ship on Nov. 27, and the next day another 10 men deserted. The inflated gold rush market and the exorbitant cost of living made survival hard for the officers. Fraser lamented that "the officers have intimated to me their intention to resign" and that he had "neither the power to arrest or punish deserters" as his crew declined in numbers.

On Nov. 25, Chaddock wrote to Fraser tendering his resignation. It was accepted and Chaddock left the ship on Dec. 1. Despite their troubles on the voyage to San Francisco, Fraser respected Chaddock, noting that "all my reliance" had been placed in him and "I am left with three officers and not a seaman among them" (Fraser to Meredith, Nov. 25, 1849). Second Lt. Pierce tendered a qualified resignation at the same time, to take effect in March of 1850, leaving Fraser "entirely unassisted in my duties" (Fraser to Meredith, Nov. 26, 1849). On Nov. 27, 2nd Lt. Edmund Kennedy also submitted a qualified resignation, to take effect on Jan. 15, 1850.

Collector Collier sympathized with Fraser, reporting to the Secretary of the Treasury that:

You have no doubt long been aware of the difficulty of keeping a crew on board of any vessel and especially government vessels at this station. The Revenue Brig Lawrence has encountered this difficulty and most of the crew have deserted. To that portion of them who have remained faithful, I have, after consultation with, and indeed after solicitation of Cap't Fraser, promised to raise their wages to \$35 per month. This is but small compensation compared with that in the Merchant Service. They now give \$100 per month (Collier to Meredith, Dec. 13, 1849)

To assist Fraser in the carrying out of his duties, particularly with a diminished crew, Collier chartered one small schooner, Argus, and purchased another, Catherine, to operate on the bay as auxiliary "cutters." In the early months of 1850 both vessels were repaired and refitted by the remaining members of Lawrence's crew, while Lawrence was at anchor off Sausalito. In justifying his actions, Collier noted that Catherine

can be kept constantly under way, in this bay, with three or four hands and will be able to render the most efficient service. The Lawrence will be kept in readiness should her services be required, but to keep her under way, would of course require a full crew which cannot be obtained without the payment of higher wages. By the course adopted the Department will save much more than the cost of the schooner, in the course of the year (Collier to Meredith, Dec. 13, 1849).

Lawrence would be kept "in readiness" on San Francisco Bay for over a year. After fitting out and provisioning Argus and Catherine, Lawrence was moved to a new anchoring directly offshore of the San Francisco waterfront. Alternating between Clarks Point (at Telegraph Hill) and Rincon Point, Lawrence and her remaining crew performed a variety of duties, boarding vessels for inspection, quelling mutinous behavior, assisting ships in trouble, recovering boats adrift in the harbor and helping ships get under way.

Smuggling was a major problem, because many merchants did not wish to pay the duties on foreign goods imported into San Francisco. Compounding the situation, some citizens, including several influential local officials, felt that it was wrong to collect revenue for the United States prior to statehood for California. Accordingly, many measures were undertaken to avoid the payment of the duties. Ships with foreign merchandise would bypass San Francisco and Monterey where collectors were on duty, sail into small ports, such as Bodega Bay, and transfer their goods to smaller coasting vessels, which would then bring the goods to market. Crew quarters on steamers and in sailing vessels were packed with illicit goods; false bottoms on crates and merchandise shipped as passengers' luggage were also used. During the course of the year that Lawrence was anchored at San Francisco, many ships were boarded and searched, and occasionally evidence of smuggling or non-payment of duties would be uncovered. Lawrence would then "seize" the ship and confiscate the smuggled merchandise, which would then be sold at auction by the collector, with the proceeds going to the United States government. The first vessel "seized" was the English ship Valparaiso on Dec. 8, 1849. On Dec. 17, Lawrence interrupted the schooner Laura Virgin's rendezvous with the barque Eliza of New York, which was transferring liquor to the smaller vessel to avoid the duty. Not every case involved smuggling, though, for on Dec. 27 Lawrence intercepted a small boat headed for the barque Boston, only to find that lunch was being brought to Boston's crew!

The "difficulty of keeping a crew on board" ships anchored in the port during the gold rush compelled Lawrence's officers to intervene for masters on numerous occasions. The first to need help was the commander of the ship Magnolia on Dec. 19, 1849. Men from the ship Daniel Grant were taken from her and placed in irons on board Lawrence on Feb. 1, 1850. As Lawrence grew crowded, other prisoners, such as those from the ship R. Pulsford, were ironed on board their own vessels. As others "refused duty" they were also arrested and placed in irons on Lawrence. By March of 1850 12 prisoners were in the brig. Unfortunately, security was embarrassingly lax, for on March 25 "at 6 a.m. when all hands were called [we] found that all the prisoners had deserted."

Assistance was also rendered to other vessels, helping ships short of hands to get under way and picking up boats which were found adrift in the harbor. The latter was a frequent duty. During a two-week period in March of 1850, for example, three boats were retrieved. When the ship Hadley Clark went aground,

16 men from Lawrence were sent on board to haul her out. Unfortunately, the tide was ebbing and the ship could not be gotten off Clarks Point. On Oct. 8, though, Lawrence was able to be more helpful:

At 4 p.m. a sloop boat capsized near the vessel with five men on it--sent a [boat] to their assistance & succeeded in saving two men, the others having sunk before assistance could reach them. (Logbook, Oct. 8, 1850)

Lawrence was at anchor on Oct. 18, 1850 when the steamer Oregon arrived from Panama with the news that California had become a state as of Sept. 9. That afternoon Lawrence sent "2 small brass guns with 31 blank cartridges [California was the 31st state] under the charge of an officer with 10 men to assist the civil authorities in the celebration..." (Logbook, Oct. 18, 1850). Eleven days later a formal celebration was held, with a parade, fireworks and speeches. Lawrence's officers and "as many men as could be spared went ashore to participate." Unfortunately the day was marred by tragedy. That afternoon, as the steamboat Sagamore prepared to leave Central Wharf, her boilers burst, ripping through the packed vessel and killing many of her passengers, some of whom were thrown into the water. Lawrence was anchored nearby, and the crew was returning from the celebration as Sagamore exploded. "The boats were instantly manned and officers were dispatched to render assistance." The survivors were plucked from the water and taken ashore to the hospital, and the boats returned three hours later "having picked up a number of valuable papers and letters, which were delivered to the consignee of the vessel" (Logbook, Oct. 29, 1850).

Lawrence also assisted in the transformation of one vessel from a floating ship ready for sea into a beached hulk. One peculiar feature of the San Francisco waterfront was the beaching and conversion of vessels into storeships, offices, hotels--even the town jail. At the time of Lawrence's arrival, a handful of ships had already been converted, and at the end of February 1850 Lawrence's crew helped strip and ready the ship Thomas Bennett for beaching (Logbook, Feb. 24-28, 1850). Thomas Bennett, which hailed from Charleston, S.C., had arrived with a complement of argonauts on Nov. 8, 1849. Losing her crew and unable to get to sea, Thomas Bennett "was hauled on the flats near what is now the corner of Sacramento and Front streets....a pier was built to the ship, and she was covered and built around with stores, the whole being known as the Thomas Bennett dock and warehouse" (Prices Current and Shipping List, Feb. 9, 1853). The ship was partially broken up in 1853. It is possible that portions of her remain beneath the streets of San Francisco, landfill having eventually covered her grave.

The crowded condition of the harbor brought additional problems to Lawrence. Termed a "forest of masts," the waterfront was a tangled mass of shipping. In 1850 it was noted that "there are now in this harbor quite a number of vessels badly moored, with anchors and cables so foul that they endanger the whole fleet" (Picayune, Nov. 27, 1850). Vessels were constantly breaking loose and hitting other ships. On Nov. 19, 1850, in the midst of a strong gale, the barque Providence lost both anchors and drifted athwart the hawse of the ship Tiara. Two boats were sent from Lawrence, and after working all night the officers and men were able to moor the two ships alongside one another (Logbook, Nov. 19, 1850). Lawrence did not fare so well during her stay. On five separate occasions she was struck by another vessel. On Jan. 21, 1850, the ship Thomas Hart drifted across Lawrence's chain. When the tide turned

she came back and "carried away our flying jib boom." On Feb. 24, the schooner Alfred ran afoul of Lawrence, carrying away the flying jib iron; on April 4 the barque Goose "came in contact with us, thereby destorying carved work on L cathead...." The ship George Pollock went afoul of the jib boom on Aug. 3, 1850; on Dec. 4 the ship Amulet struck Lawrence and "carried away the main gaff."

Coastal Surveillance

A year of riding at anchor, a deserting crew, and having been rammed began to bother Fraser. In October of 1850 he complained to his superiors, noting "two years have now elapsed since my departure from the Chesapeake Bay, during which time I have scarcely been out of view from the vessel which I command" (Fraser to Corwin, Oct. 31, 1850). Collector Collier sympathized with Fraser, noting

...the detention of the Lawrence in this harbor since you first arrived as at my suggestion and was regarded by me not only advisable but indispensable--indispensible not only for the enforcement of the Revenue Laws of the United States but in preserving the peace and the maintenance of order in the bay--Few men, I hope, had more difficult or responsible duties to perform and no man could have more faithfully and promptly discharged those duties. When it is remembered that you have been in a harbor where from five to six hundred vessels were riding at anchor--in the midst of a great excitement--with crews insubordinate & lawless--without the aid of civil authorities or civil process & when day & night you have been called upon to render assistance & to aid Masters of vessels in suppressing mutiny & violence, surely it becomes me to bear willing testimony to the necessity of your presence & your promptness in the discharge of your onerous duties (Collier to Fraser, Nov. 21, 1850)

A variation in the routine finally came for Fraser and Lawrence late in 1850.

On Sept. 27, 1850 the Revenue Marine bark Polk arrived in San Francisco. The ship was unstable and was to serve only on the bay. Polk was to augment Lawrence but not to interfere with her duties. With the arrival of Polk, Collector Collier felt that Lawrence could be spared to go to sea "and proceed down the coast as far as San Diego, touching at the various intermediate ports... making such examinations of the harbours upon the coast as it might prove serviceable to the commerce of the Country" (Collier to Fraser, Nov. 21, 1850). Throughout October and November Lawrence was refitted, repaired and made ready for sea. On Dec. 15 the two 32-lb. guns were taken out, to be stored at Sausalito. Lawrence then was provisioned, and on Dec. 26, 1850, finally left San Francisco, clearing the Farallones that evening.

Five days later, having beaten down the coast, Lawrence was in the midst of the Channel Islands. San Miguel Island was passed on Dec. 31 and San Nicolas was sighted on New Year's Day. On Jan. 2 Lawrence hove to near Santa Catalina, and the next day Fraser entered the main harbor of Avalon in one of the ship's boats. Having sounded the harbor "and finding it a safe one," Fraser

decided to enter in Lawrence. At 5 a.m. on Jan. 4 Lawrence stood in for the harbor, anchoring at 8:30 in 2 fathoms of water. That afternoon, though, as the tide dropped, Lawrence touched bottom and the following day was moved to a deeper anchorage. As the crew cleaned the ship, Fraser made observations, continuing the sounding and triangulating the harbor's position. The survey was completed on Jan. 13. The next day was marked by a new discovery. The seemingly deserted island was inhabited! Patrick McGill, who had voyaged to California in 1847 as a soldier in Company A of the New York Volunteers to fight in the Mexican War, had made his way to the island "looking for a place to locate himself." McGill had landed the day before Lawrence arrived "in a suffering condition and in want of the necessities of life." Fraser ordered a tent made for McGill; 60 lbs. of pork, 100 lbs. of bread and one ration of food from each crew member was supplied, "and to enable him to dig a well a shovel and deck bucket" were provided (Logbook, Jan. 14 and 16, 1851). The next day Lawrence weighed anchor and sailed out of the harbor. McGill's fate is unknown.

On Jan. 19 Lawrence entered the harbor of San Diego, anchoring off the "New Town" at 3:30 p.m. The crew was employed at "watering, wooding, and coaling" the ship for the next few days. On the 24th Fraser and his new first lieutenant, Charles Bennett, along with the ship's surgeon and seven men, went ashore to do some exploring, returning on Feb. 1. On Feb. 4 the steamship Panama arrived from San Francisco, stopping while enroute to Panama to land Gen. Persifor Smith of the U.S. Army and his party. Fraser dispatched two boats to convey Smith and his "suite" from Panama to shore, "when the boats passed the vessel a salute of 13 guns were fired" (Logbook, Feb. 4, 1851). While in San Diego trouble among the crew again occurred. On Feb. 9 a boat was sent to shore to find Fraser and surgeon Lee. Fraser was informed that one of the men "had been badly wounded by a sting bee." Fraser requested that the surgeon go back on board with him to tend to the man. Lee refused, whereby Fraser went alone. Finding the man "in great pain," he sent a boat ashore to ask Lee a second time. Lee again refused, and that evening Fraser landed, discharging Lee, "as he rendered no obedience to me" (Logbook, Feb. 9, 1851). The next day Lawrence shifted her anchorage to the "plia" [La Playa, or "The Beach" on Point Loma, opposite North Island]. The next day the loss of the surgeon was truly felt. Two of the crew, William Graham and William Lobb, got into a fight. Graham bit "a piece off the nose" of Lobb, stabbed him in the face, and "otherwise seriously injured him" (Logbook, Feb. 11, 1851). Lobb recovered. Graham had half the hair on his head shaved off, was flogged and turned ashore on the 15th. That afternoon Lawrence weighed anchor and stood out for sea, passing Point Loma at 9 a.m.

Crossing the Pacific Lawrence once again sailed to the Hawaiian Islands, anchoring at Hilo on March 7, 1851. The crew was kept busy renewing the rigging and cleaning the ship. Fresh provisions and water were taken on board. On March 17, "at sunrise hoisted the Hawaiian flag at the fore and fired a salute of 21 guns. At 12 M[eridian] and at sundown also fired a salute of 21 guns in honor of the present king's birthday." That evening the gunner was sent on shore with 12 rockets, six blue lights and false fires "to assist the citizens in celebrating..." (Logbook, March 17, 1851). On March 23 Lawrence cleared Hilo and made sail for Honolulu, arriving there on the 26th. Yards, gaffs, two of the ship's boats and the brass blocks of the tiller were sent ashore for repairs, adequate facilities not being available at Hilo. The ship was painted during the first week of April, and on April 10 Lawrence again weighed anchor and stood for sea, bound for San Francisco. Point Reyes came into sight

on May 4, and by that evening Lawrence was at anchor one mile south of Rincon Point at San Francisco. That day a great fire had devastated the town; more than 2,000 structures had been destroyed. For much of the next month a party of Lawrence men were sent ashore each night to guard the vault at the custom house.

Once again Lawrence entered into the "regular" duties attendant to the station. Vessels were boarded, recalcitrant seamen were punished, and assistance was rendered to vessels. A new collector was on hand to greet her, Collier having been relieved and Thomas Butler King taking the post. New orders also greeted the ship. Commencing on June 10 Lawrence was to send a boat with a commissioned officer in charge "to row guard around the harbor during the night to prevent smuggling" (Logbook, June 10, 1851). In addition, the state authorities had notified Collector King of their intention of enforcing a new state law forbidding any passengers from New South Wales to land in San Francisco, because anti-Australian sentiment was running high at the time. Lawrence was therefore ordered to board any and all British vessels entering the harbor, "detain all passengers" and wait for the collector. More significant was the news that Fraser's request for a leave of absence had been granted. On June 7 he was relieved of command by Capt. Douglass Ottinger, a Revenue Marine officer on leave who was privately employed on the coast as commander of the Pacific Mail Steamship Isthmus. Isthmus arrived from Panama on June 6, and the next day Ottinger presented himself. Since he had just learned of his recall to duty, Ottinger was not ready to accept permanent command. First Lt. Bennett was left in temporary command until Ottinger's return in September. Fraser left the ship on June 13, borrowing one of the brig's Colt repeaters, and sailed for the Hawaiian Islands. He would ultimately return to the Eastern seaboard in 1852, be suspended from duty, and then be reinstated to a long career.

Under Bennett's command, Lawrence again readied for sea, sailing from San Francisco on July 18 for a cruise "to the northward" to investigate ports and coasting vessels for evidence of smuggling. Returning to San Francisco late in August, Lawrence remained for a short time, sailing again on Sept. 15. Journeying to the south, Lawrence called at Monterey on Sept. 17. Departing on the 25th, Lawrence went as far south as San Luis Obispo; anchoring and "having seen nothing to indicate smuggling" they quickly left, turning north. Reaching Bodega Bay on Oct. 7, but unable to enter due to heavy seas, Lawrence returned to San Francisco, anchoring off Clark's Point on Oct. 8. On the 10th "Capt. Douglass Ottinger came on board and assumed command" (Logbook, Oct. 10, 1851). The next day Lawrence weighed anchor and stood across the bay for Benicia, arriving on the 12th. There the ship was overhauled once again to prepare her for additional duty. On the 15th Ottinger reported to Collector King

...the Lawrence will be ready for sea by the 17th...we have nearly finished the repairs on the rigging and sails and will lay her on the beach this evening to clean the copper....(Ottinger to King, Oct. 15, 1851)

The bottom was very foul, because the ship had not been careened since her launch in August of 1848. Lawrence returned to San Francisco on Oct. 20, where orders awaited Ottinger. Lawrence proceeded to Sausalito, where the 32-lb. guns landed by Fraser were re-emplaced on Oct. 24. The next day Lawrence anchored off Alcatraz Island, where the crew engaged in gun drill and target practice. Additional cannon were emplaced on the 27th, when two 12-lb. guns were brought

over from Polk. This brought the number of guns on board Lawrence to six: the two 32-lb. cannon, two 12-lb. cannon, and the two 6-lb. cannon. Lawrence was ready for action.

Action came quickly. On Oct. 29 the clipper ship Challenge anchored at San Francisco after a 102 day passage from New York. Capt. Robert H. Waterman and his men had not seen eye-to-eye during the passage. Many men had been battered and some killed by Waterman and his "bucko" mate. Driven to desperation, some of the crew had mutinied, attacking and stabbing the mate. The uprising was quelled but not forgotten. Upon anchoring, Waterman sent word to Lawrence that he needed help. "By request of Captain Waterman sent a boat on board in charge of an Officer; secured seven men in Irons charged with mutiny and brought them on board" (Logbook, Oct. 29, 1851). Lawrence left for the bay, on other duty and did not return to her anchorage until the next day. On Oct. 31 Lawrence once again became involved with Challenge. Public sentiment had arisen in favor of the clipper's crew and against her master and mate. Threats had driven both men into hiding, and the possibility of the mob's destroying the ship was very real. The consignees of the ship wrote Ottinger on the 31st:

Owing to a mob having taken forcible possession of the ship "Challenge" to our consignment and having threatened to injure her in any way in their power even to scuttling her & we having called upon the U.S. Marshall to protect the property of our constituents; we now ask that you will with the force at your disposal assist in protecting the ship and property on board of her (Alsop & Co. to Ottinger, Oct. 31, 1851)

Ottinger, Lt. Richmond of Polk and a force of men proceeded to Challenge, where they were joined by local officials, the U.S. Marshal, and members of the Committee of Vigilance (who were in support of the legal authorities and opposed the destruction of the ship) to face a crowd numbering more than 1,000. The crowd dispersed without incident, but not before some damage had been done when the mob had ransacked the ship searching for Waterman. Lawrence's men were stationed on board during the night. By the morning the threat had dissipated. Waterman and Mate James Douglass were ultimately brought to trial for murder. Ottinger was called as a witness in the case, which finally ended on Feb. 10, 1852, when both men were found guilty of lesser charges of assault and fined. It was rather a quiet end to an emotion-charged, notorious case.

The Challenge affair was not the only excitement afforded Lawrence's crew. Rumors had reached the collector that certain vessels were carrying munitions weapons and filibusters to Hawaii, where they would take forcible possession of the islands. Since this sort of thing was definitely against the laws of the United States, Lawrence was ordered to search the suspected ships. The ship Gamecock of New York was stopped by firing a shot across her bow on Oct. 29 just after Lawrence had left Challenge. The ship was searched but nothing suspicious was found. Three other vessels, Colonel Fremont, Keoka and Joe had already been stopped, boarded and searched on the 23rd, with nothing being found. The additional armament emplaced on Lawrence on the 23rd and 27th had been in response to a possible fight with the suspected "filibusters"

We keep a constant watch on the conditions and movements of all the vessels which you have named in your directions

to me and have them under our eye several times during the night. Our boats are moving quietly around the shipping and I do not think that they can escape us; Our guns are kept loaded with 32-lb. shot and matches kept burning from dark until daylight (Ottinger to King, Oct. 27, 1851)

No further evidence was uncovered concerning the suspected plot. Ottinger noted on Oct. 30 that he had heard the expedition had been broken up, "but as this may be a Ruse I shall not lose sight...I am ready for getting away at any moment..." (Ottinger to King, Oct. 30, 1851).

The Wreck of Lawrence

In early November Lawrence continued her normal duties, searching vessels for evidence of smuggling, and in order to aid masters. On Nov. 9 a mass desertion of the ship Raymond was thwarted, and on the next day Ottinger and his crew arrested three men from a boarding house who had threatened the captain and mate of the British ship William Money with "violent personal abuse" while helping the crew desert. Raymond again hailed for assistance; her officers had also been attacked and the crew had deserted. Alarmed, Ottinger had the match fires lit and "depressed the guns for a close shot in case of an attack from boats" (Logbook, Nov. 10, 1851). He evidently feared that the men who had attacked the officers of Raymond might assault Lawrence to rescue their mates, who were ironed in the hold. The night passed without incident, and the next morning the three men were taken ashore and turned over to the civil authorities. On Nov. 15 the clipper ship Telegraph and the ship Flavius were boarded and searched. They were the last vessels boarded by Lawrence in San Francisco Bay. Three days later Lawrence stood to sea, enroute to Monterey, where her mission was to pick up the collector of the port and bring him to San Francisco.

Lawrence arrived at Monterey on Nov. 20, sailing the next day with Collector William H. Russell on board. On the 22nd she anchored at Santa Cruz, where the schooners Empire and Sarah Hooper were boarded and searched. Sarah Hooper was found to be lacking a clearance certificate and was also found to be loaded with a "quantity of domestic and foreign goods...." After reporting her to the collector at Santa Cruz, Lawrence again stood for sea. Sailing north for San Francisco, Lawrence encountered no difficulty, arriving off the Golden Gate on the evening of Nov. 25 and anchoring near Point Lobos, the southern "head" of the harbor entrance. Unfortunately for Lawrence, the tide had ebbed and was running with a strong set to the south. The sea was running from the west, almost directly toward the land. After one hour at anchor,

Two topping seas have already boarded us, there was great danger of having the decks swept. Commenced heaving in chain, to change our position. At 8:30 P.M. parted the cable. We were then driven in a direction that Capt. Ottinger ...judged to be towards the shoal water on the Bar, our intention being to get the vessel over the breakers and anchor inside, in deep water, where we could ride in safety; but being closer to the shore than we judged, the ship was in the breakers, near the beach, before we could distinguish between them and those that were foaming in every direction around us....The vessel first struck in 3½ fathoms water, and in the next breaker came down with such tremendous

force, that it appeared as if every seam and timber in her must have started. At the same time, tons of water fell on our decks. By changing the position of the sails, the ship's head was kept toward the beach and stern to the breakers. We then let go the bower anchor, to lighten her forward, as she was coming broadside to. The vessel then laid bows toward the land, continuing to strike very heavily, and force her way through heavy combing seas toward the beach (Logbook, Nov. 25, 1851).

The ship struck the beach at about 9:00 p.m. Discipline and order were maintained on board throughout the night despite "a short time when none could feel that they would see another day" (Ottinger to King, Nov. 26, 1851). Ottinger had apparently misjudged his position due to poor visibility. He also misread the tide, later stating that he felt the tide was at flood. If so, Lawrence would have been carried through the Golden Gate with the incoming tide.

The next morning Lawrence was hove up onto the beach by means of a awser carried ashore. The ship lay in 3½ feet of water at low tide that morning. High tide at 1:05 p.m. would bring her even higher up on shore (San Francisco Daily Alta California, Nov. 26, 1851). The launch and a cutter were lowered, and valuable items were transported to the beach. Stripping the wreck commenced in earnest on the 27th with the assistance of troops and teams of horses from the Presidio of San Francisco. Wagons were loaded with papers, navigational instruments, small arms, ammunition "and other articles of ship's property" and sent to the military storehouse at the Presidio. Sails and rigging were being sent ashore at the same time:

We are now engaged in getting the Equipment and stores on shore, our Seamen performing their duty in the most prompt and cheerful manner, though their labor has been very severe (Ottinger to King, Nov. 28, 1851)

Cabin and wardroom furniture was removed on the 28th along with the medicine chest and sent to the Presidio. Meanwhile, news of the wreck had reached San Francisco. The "painful intelligence" was published on the 28th for the first time. The pilot boat Rialto reported seeing a "black clipper brig (supposed to be the Revenue Brig Lawrence)" the day before:

Yesterday (27th) they passed close in to shore and discovered the brig ashore and the crew stripping her of yards masts and rigging. They have a tent on shore close to the wreck, which lies about four miles southward of Point Lobos. (San Francisco Daily Alta California, Nov. 28, 1851)

The 29th was spent getting the last of the rigging "chains, hawsers &c" shore and to the Presidio. No mention is made of further salvage, but it is presumed that a great deal of valuable items would have been pulled off the wreck. She was easily accessible, so accessible, in fact, that Ottinger noted

It is my opinion that the "Lawrence" could be got off again, but the expense attending it with the requisite repairs would doubtless amount to a much larger sum than

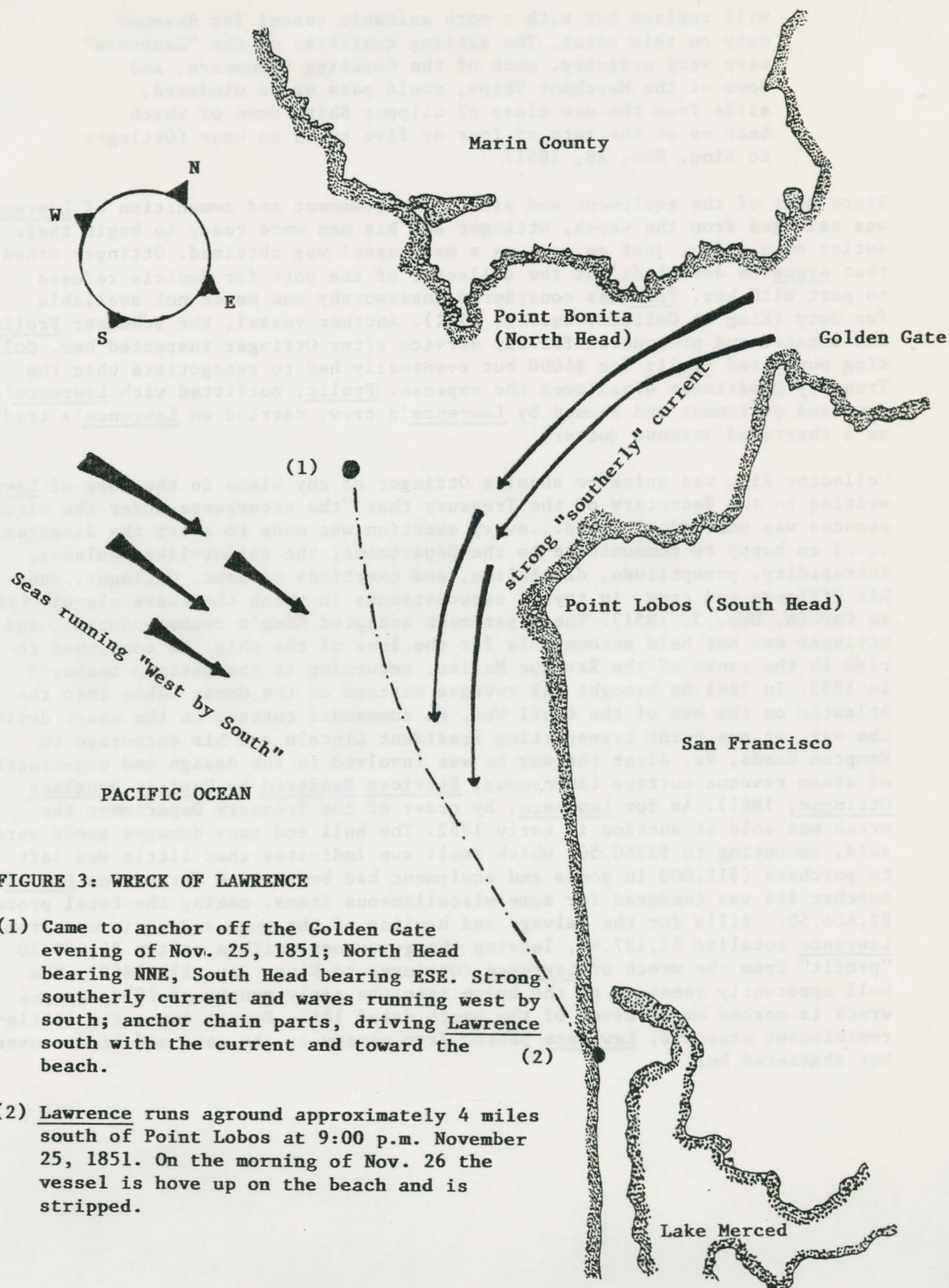


FIGURE 3: WRECK OF LAWRENCE

- (1) Came to anchor off the Golden Gate evening of Nov. 25, 1851; North Head bearing NNE, South Head bearing ESE. Strong southerly current and waves running west by south; anchor chain parts, driving Lawrence south with the current and toward the beach.
- (2) Lawrence runs aground approximately 4 miles south of Point Lobos at 9:00 p.m. November 25, 1851. On the morning of Nov. 26 the vessel is hove up on the beach and is stripped.

will replace her with a more suitable vessel for Revenue duty on this coast. The sailing qualities of the "Lawrence" were very ordinary, most of the Coasting Schooners, and some of the Merchant Ships, could pass us to windward, aside from the new class of Clipper Ships some of which beat us at the rate of four or five knots an hour (Ottinger to King, Nov. 28, 1851)

Since most of the equipment and all of the armament and ammunition of Lawrence was salvaged from the wreck, Ottinger and his men were ready to begin their duties once again, just as soon as a new vessel was obtained. Ottinger asked that Argus be detailed, but the collector of the port for Benicia refused to part with her. Polk was considered unseaworthy and hence not available for duty (King to Gallaer, Dec. 1, 1851). Another vessel, the schooner Frolic, was located and pronounced fit for service after Ottinger inspected her. Collector King purchased Frolic for \$4000 but eventually had to renegotiate when the Treasury Department disallowed the expense. Frolic, outfitted with Lawrence's guns and equipment and manned by Lawrence's crew, carried on Lawrence's tradition as a chartered revenue cutter.

Collector King was quick to absolve Ottinger of any blame in the loss of Lawrence, writing to the Secretary of the Treasury that "the occurrence under the circumstances was unavoidable, and...every exertion was made to avert the disasterI am happy to communicate to the Department, the sailor-like coolness, intrepidity, promptitude, discipline, and exertions of Capt. Ottinger, and his Officers and crew, in trying circumstances in which they were placed" (King to Corwin, Dec. 3, 1851). The department accepted King's recommendation, and Ottinger was not held accountable for the loss of the ship. He continued to rise in the ranks of the Revenue Marine, returning to the Eastern seaboard in 1853. In 1861 he brought all revenue cutters on the Great Lakes into the Atlantic on the eve of the Civil War. He commanded cutters on the coast during the war, at one point transporting President Lincoln and his entourage to Hampton Roads, Va. After the war he was involved in the design and construction of steam revenue cutters (Anonymous, Services Rendered by Captain Douglass Ottinger, 1881). As for Lawrence, by order of the Treasury Department the wreck was sold at auction in early 1852. The hull and many damaged goods were sold, amounting to \$2360.50, which small sum indicates that little was left to purchase (\$12,000 in goods and equipment had been saved for use on Frolic). Another \$46 was tendered for some miscellaneous items, making the total proceeds \$2,406.50. Bills for the salvage and hauling of the guns and equipment from Lawrence totalled \$1,127.40, leaving the government with a paltry \$1,279.10 "profit" from the wreck of Lawrence (Ottinger to King, Jan. 21, 1852). The hull apparently remained on the beach into the early months of 1852, as the wreck is marked on a survey of the beach dated 1852. Except for a few little-noticed reminiscent accounts, Lawrence passed from memory as the sand and tides covered her shattered hulk.

OTHER VESSELS IN STUDY AREA:

In addition to Lawrence, two other vessels, the schooners Aimer and William L. Beebe, may have wrecked within the study area.

Aimer

The schooner Aimer, built in Coos Bay, Ore., in or around 1870, was a small craft registered at 96.25 tons and was involved in the lumber trade, carrying lumber from small logging ports to San Francisco (Merchant Vessels 1871:10). On Monday, June 26, 1871, Aimer arrived off San Francisco with 140 tons of coal, 35,000 board feet of lumber and some cord wood from Coos Bay. A dense fog and a strong southerly current caused the captain to miss his bearings while the schooner drifted past the Golden Gate. A light from the Ocean-Side House (a structure located at what is now Vicente Street and the Great Highway) was mistaken for the light at Point Bonita, the northern head of the harbor entrance, and Aimer was soon in the breakers. The anchors were let go but failed to hold, and Aimer went up on the beach, where she filled with water (Alta California, June 28, 1871:1). The position of the beached vessel was given as "on the beach abreast of the Ocean-Side House." The hope of getting her off was slight. The coal was lost, while "the rigging and sails will probably be saved, but the vessel will go to pieces, as the sea is making a great breach in her" (Alta California, June 19, 1871:1). Amazingly, the wreck held together sufficiently to be pulled off the beach on Aug. 9, 1871. The damage was substantial, though, as beachcombers had joined the tides in stripping Aimer of her mainmast, bowsprit, two deck beams and part of the rail and bulwarks (Alta California, Aug. 10, 1871:1). Unfortunately, the hawsers attached to the wreck and the two tugs that pulled her off parted, and Aimer once again went on the beach, broadside, where she was abandoned. No other mention of salvage can be found, so it is assumed that Aimer was a total loss somewhere close to where she originally beached on June 26.

William L. Beebe

William L. Beebe, built in Seattle, Wash., in 1875, was a three-masted schooner 134.7 feet long, with a breadth of 33.3 feet, a depth of hold of 10.7 feet. She was registered at 281.43 net tons (Merchant Vessels 1891:263). Like Aimer, William L. Beebe was engaged in the lumber trade, and at the time of her loss was bringing a cargo of lumber to San Francisco from Port Blakeley, Wash. After a rough 11-day passage, William L. Beebe arrived at the San Francisco Bar at 5:30 a.m. on Dec. 10, 1894. The sea was smooth, and William L. Beebe was crossing the bar when

Suddenly and without warning an immense breaker rolled over the stern of the schooner, carrying away the wheel-house and knocking Olsen [the crewman at the wheel] from his position...the first wave practically staggered the Beebe. She did not respond readily to the helm and became unmanageable (Daily Evening Bulletin, Dec. 11, 1894:1)

There was no wind, and the vessel broadsided as she drifted south along the edge of the bar, with occasional breakers boarding her. Finally, at 7:30 a.m. William L. Beebe struck on the beach. "She dove into the sand in a most remarkable manner, becoming imbedded so firmly that there was no possibility of her getting off (Daily Evening Bulletin, Dec. 11, 1894:1). The crew took to the rigging, remaining there until 10:30 a.m. when they were rescued by the crew of the United States Life Saving Service station on Ocean Beach. The vessel apparently continued to settle deeper into the sand and was driven up high since the tide was at flood (and high) William L. Beebe struck with such force that the mizzen mast was started. According to one account,

She has a big hole in her bow and is buried up to her water-line in sand, which makes it impossible to float her. Within a week or two she will probably have sunk nearly out of sight. About the only use that can be made of her is for firewood...The beach was strewn with broken lumber and rigging... (Examiner, Dec. 11, 1894)

The schooner's position was given as being about three miles south of the Life-Saving Station, which was located near the beach at Golden Gate Park (Near the present day intersection of Fulton Street and the Great Highway) and abreast of the "old Ocean House," or the former Ocean-Side House at the present location of Vicente Street and the Great Highway. William L. Beebe was lost in the same area where Aimer had wrecked 23 years earlier. The wreck was sold at auction and is presumed to have been a total loss (Daily Morning Call, Dec. 11, 1894).

INTRUSIVE FEATURES

An intake pier for the nearby Fleischhacker Pool, which was built in 1925 and operated until 1971; a temporary but substantial pier constructed in 1981 and 1982 for a new sewer outfall for the city and county of San Francisco and debris jettisoned from a barge stranded in 1983 lie within the project area and constitute major intrusive factors.

Fleischhacker Pool Intake

Built in 1924 and opened on April 23, 1925, Fleishhacker Pool, at the foot of Sloat Street, was named for Herbert Fleishhacker, a member of the Board of Supervisors and President of the Board of Park Commissioners. The pool, the largest outdoor pool in San Francisco, held 6,500,000 gallons of warmed salt water supplied by an intake that ran into the ocean from the foot of Sloat Street. The intake, made up of sections of flanged iron pipe bolted together with brass bolts and nuts and supported by a low-lying concrete and wood pier, can still be seen, though it is usually awash at high tide. The intake extends some 500 feet offshore, running at a southerly angle. Fleishhacker Pool was closed on July 1, 1971, after a crack was discovered in the pool. In 1982 the 1,000-by-150-foot pool was filled with debris from the Great Highway, which had been torn up to allow construction of a new sewer system (Hansen 1980:234).

Southwest Ocean Outfall

The southern end of the project area is marked by the temporary pier being used to construct the southwest ocean outfall of a major new sewer system for the city and county of San Francisco. The outfall, composed of 12-foot-diameter reinforced concrete pipe in 24-foot sections, will extend 4½ miles offshore. The pipe is buried 30 feet below the sea bed. The temporary pier, which runs for approximately 1 mile through the surf zone, was constructed between October of 1981 and June of 1982. The pier was built with steel piles driven into the sea floor every 30 feet apart and joined with crossbeams. The pier, 32 feet wide, stands 28 feet above the water and supports a railway on which cranes, pile drivers and other equipment for laying pipe ride. Below the pier lies the pipe, which was laid between two sets of sheet piles driven into the seabed. The piles are 50-foot-long Z-shaped steel sheets. The area between the piles was dredged to a depth of 30 feet. The installed pipe was covered with rock and sand. The pier will ultimately be removed, but debris from construction, including structure and equipment dropped off the pier will remain with the pipe and sheet piles (San Francisco Clean Water Program 1981:1-2). Discussions with project engineers and an examination of the dredge logbooks for the pipe laying indicate that no evidence of cultural material was encountered during dredging.

Stranding of Betty L.

On the morning of March 1, 1983 the steel-hulled ocean-going crane barge Betty L., a 420-foot long, 6,103-ton vessel was moored nearly 1/2 mile offshore near the trestle of the Southwest Ocean Outfall, where it had been dredging and laying sections of the reinforced concrete sewer pipe. At 9:00 a.m. the weather began to deteriorate rapidly, with winds in excess of 30 knots

DISCRIMINATING LAWRENCE REMAINS:

Both the structural remains and an undetermined assemblage of artifacts may compose the archeological site of Lawrence. While little is known of Lawrence's characteristics and accounts of salvage are sketchy, much can still be surmised from the historical record. Certain features and artifacts encountered during a testing of a maritime archeological site can lead to establishing a positive vessel identification. It is important, therefore, to identify diagnostic construction features or particular artifacts that would be associated with the wreck of Lawrence, should testing of selected anomalies be pursued at a later date.

Unfortunately no detailed accounts of Lawrence's construction exist. Some construction details can be determined from references in the ship's log, though her basic size is known only from a contemporary newspaper account. It is probable that Lawrence conformed to standards and materials specified in Treasury Department specifications for the construction of Revenue Marine vessels dated Sept. 6, 1848, just two weeks after Lawrence was launched (See Appendix). Timber used would be live oak, white oak, cedar, yellow pine, locust and mahogany. Drifts and other bolts would be copper, spikes would be yellow metal (composition) with iron spikes used for the decking. Lawrence was copper-sheathed, as indicated by the references to the copper in her logbook. Lawrence was listed in a contemporary newspaper account as being 96½ feet long with a 24-foot beam. Discrimination of Lawrence remains could probably be done on the basis of wood type, since Aimer and William L. Beebe were likely built with indigenous Douglas Fir, as were most West Coast schooners. Size difference, and in particular the lines and characteristics of Lawrence's extreme "Baltimore Clipper" design, could also be compared with other remains, should large structural remains be extant. Lawrence was rigged as a brig, whereas Aimer and William L. Beebe were schooners. Due to similarity in rig and the fact that the logbook references the salvage of Lawrence's rigging, yards, topmasts and sails, rigging is probably not sufficiently represented in the archeological record to be diagnostic. Chain plates might be present, though, and might prove diagnostic if older, rolled "bar" style chain plates were found. This style would more likely be associated with the 1848 Lawrence and flat-strap chain plates would more likely be associated with the 1870 Aimer or the 1875 William L. Beebe.

In the absence of a large body of definitive information about the construction characteristics of Lawrence, emphasis on associated artifactual materials will be important. The principal difference in the three vessels is that Lawrence was obviously fitted as a naval vessel, while Aimer and William L. Beebe were merchant vessels. Therefore, any artifactual materials associated with ordnance--such as shot, shell, primers, gear associated with cannon, edged weapons and ammunition for Colt Repeating Pistols, Model 1848--would be considered as diagnostic indicators of Lawrence remains. Any crockery bearing the imprint or mark of C.W. Boteler or Baltimore, Md., who outfitted Lawrence with ceramic goods, would also be diagnostic. Since 20 years separates the wrecks of Lawrence and Aimer, and 23 years separates the wrecks of Aimer and William L. Beebe, ceramics or glasswares that can be firmly dated to the specific eras would be the final known diagnostic factor. Lawrence was carrying ballast of value, as indicated by Ottinger's emphasis in his report on saving it. Lawrence carried Kentledge (iron pigs) as ballast as opposed to gravel or rock in Aimer and William L. Beebe. Ballast should be associated with the site, since Lawrence probably conformed to Naval standards and was more heavily ballasted than a merchant vessel carrying cargo would be. This was important, since Lawrence

was a small vessel of light draft, heavily rigged for speed, and carrying heavy armament on deck. Since Lawrence would likely carry ballast equal to an estimated one-third of her displaced tonnage (144 tons) or some 50 tons, it seems improbable that all ballast would be removed.

In conclusion, characteristics of vessel construction and specific classes and types of artifacts can be utilized to discriminate Lawrence remains. It should be assumed that any vessel remains built with Douglas Fir (as Aimer and William L. Beebe would) would not be from Lawrence, which was built with Eastern timber. The relative size of vessel remains, should intact structure be present, or the dimensions of certain structural elements such as frames, would indicate the size of the shipwrecked vessel. There is sufficient size difference in the three vessels in the project area (Aimer 96.25 tons, Lawrence estimated 144 tons, William L. Beebe 281.43 tons) to probably discriminate remains. Copper sheathing and fastenings will particularly be diagnostic, Lawrence would be the only vessel in the study area so fitted. The trade for which Aimer and William L. Beebe were intended was rough, and the vessels engaged in it were notoriously short-lived (as Aimer's loss indicated) and hence expensive construction techniques and materials such as copper sheathing and fastenings were not employed. Likewise, artifactual materials will be diagnostic as Lawrence was an armed vessel while Aimer and William L. Beebe were not.

**KNOWN AND ESTIMATED CONSTRUCTION VARIATIONS
LAWRENCE, AIMER, WILLIAM L. BEEBE**

	Tonnage	Length	Beam	Depth of Hold	Timber	Fastenings	Sheathing	Ballast	Rig
<u>LAWRENCE</u>	144	96½'	24'	8.8'	Live oak white oak locust yellow pine mahogany	Copper Yellow metal	Copper	Kentledge	Brig 2 masts
<u>AIMER</u>	96.25				Douglas fir	Iron	none	Rock Gravel	Schooner 2 masts
<u>WILLIAM L. BEEBE</u>	281.43	134.7'	33.3'	10.7'	Douglas fir	Iron	none	Rock Gravel	Schooner 3 masts

SELECTION OF STUDY AREA:

A careful analysis of the accounts of the loss of Lawrence, as well as a review of tide, wave and current conditions along Ocean Beach, and an 1852 Coast Survey chart marking a wreck believed to be Lawrence, were used to set the boundaries of the study area. Lawrence is listed as being lost on Ocean Beach, the western shore of San Francisco, and a mid-19th-century manuscript shipwreck chart kept by George Davidson, head of the United States Coast and Geodetic Survey on the Pacific Coast (at the period) and author of the Pacific Coast Pilot for 1889. The location of the wreck given by Davidson would place it approximately 4 miles south of the Cliff House below the present-day intersection of Sloat Boulevard and the Great Highway. Davidson's chart, which lists wrecks that occurred up into the early 1890s, most probably represents more than three decades of Davidson's amassing of shipwreck accounts during his tenure with the Coast and Geodetic Survey. However, despite his sound reputation and experience, the chart is a secondary resource and could not solely be relied upon.

Newspaper accounts, the log of Lawrence, and the reports of Captain Ottinger concerning the wreck were reconciled with known wave, tide and current conditions at Ocean Beach, and this evidence corroborated the location given by Davidson. The log entry for Nov. 25 notes that Lawrence came to anchor on the San Francisco Bar, with the north head at Point Bonita bearing NNE from the bow and the south head at Point Lobos bearing ESE from the bow, or just south of the channel close to shore. The weather was calm with light breezes, the sea was running heavily west by south (Ottinger to King, Nov. 26, 1851). A strong southerly current (from the ebb tide) caught Lawrence as increasingly heavy seas boarded the vessel. While the crew was engaged in raising the anchor the cable parted, driving Lawrence south in the direction of the current. Lawrence drifted with the current and was progressively pushed east by the waves until caught by breakers, which carried her ashore into 3 or 4 feet of water. The characteristics of the wreck of Lawrence are similar to the wrecks of William L. Beebe, King Philip, Aimer, Atlantic, Neptune and several other vessels lost on Ocean Beach. A strong ebbing current running south along the beach, heavy seas running to shore and a lack of wind combined to drive all of these vessels ashore within a 4-mile area of the beach. Beebe and Aimer went ashore at the area thought to be where Lawrence grounded 4 miles south of Point Lobos. King Philip and Atlantic grounded 2 miles north of that location, and Neptune was lost 2 miles south. The conditions that wrecked Lawrence are not unusual for the locale, which has claimed at least 16 vessels as total losses between 1851 and 1926.

Lawrence grounded approximately 4 miles south of the head. Capt. Ottinger, in reporting the wreck, gave his position on the beach as "1½ miles below the Entrance to San Francisco Bay" or the south head. Ottinger apparently was mistaken when he penned his report on the morning after the wreck, because it does not agree with any other distance cited in contemporary accounts. Ottinger does express uncertainty in his reckoning of his position, noting that the shore was "somewhat obscured by the mist..." (Ottinger to King, Nov. 26, 1851). The San Francisco Alta California, reporting the wreck, stated that Lawrence anchored "four miles below Point Lobos" (Alta California, Nov. 28, 1851). Yet from Lawrence's logbook her position is known to have been

in mid-channel, just off the heads. It could be that the 4-mile position given by the Alta was where the ship came ashore. The San Francisco Herald cited a letter from Monterey Collector Russell, who had been on Lawrence, which gave the wreck's position as "between Point Lobos and Point Pedro" (that is, on Ocean Beach) and "about three miles south of the Golden Gate." As the actual Golden Gate has too narrow a bight for this figure, and as Russell's statement indicates that the wreck was on Ocean Beach, the point 3 miles distant would logically be the south head, or Point Lobos (San Francisco Herald, Nov. 28, 1851). Another reference to the position of the wreck, which can be construed as being more definitive in that it was reported by the pilot boat Rialto, noted that the pilots saw Lawrence ashore with "the crew stripping her of yards masts and rigging. They have a tent on shore close to the wreck, which lays about four miles southward of Point Lobos" (Alta California, Nov. 28, 1851).

Another definitive piece of contemporary evidence that places the wreck 4 miles south of Point Lobos is a manuscript survey chart of Ocean Beach based on observations made during late 1851 and early 1852. Dated 1852, the chart marks one wreck on Ocean Beach, 4 miles south of Point Lobos. The only vessel lost on the beach in 1850-1853 was Lawrence. The 1852 chart's wreck location would confirm the contemporary accounts, which state a distance in the area of 4 miles. Since it also matches the location cited on Davidson's chart, it may have been Davidson's source. The evidence presented by the chart, the contemporary accounts, the description of the wreck given by the log and in Ottinger's report, and known tide, wave and current conditions for Ocean Beach indicate that Lawrence lies approximately 4 miles south of Point Lobos.

After it was decided that the 1852 chart's location was indeed the most reliable evidence, the problem of relating the geographical features on the then-undeveloped beach area to today's residential zone was tackled. Only one major feature was found to remain constant: Lake Merced, carefully delineated in the 1852 chart and on modern United States Geological Survey quadrangles, has experienced no major changes in its shoreline contours. Since the wreck believed to be Lawrence lay near an abrupt and prominent lake shoreline feature, it was felt that identifying this feature on the current maps would pinpoint the wreck site in relation to modern landmarks such as the Great Highway. The feature was found to lie near Fleishhacker Pool close to the foot of Sloat Boulevard. To corroborate the visual comparison of the 1852 chart with modern maps, a survey was made of maps showing Lake Merced between 1869 and 1940; the location and contours of the feature remained constant. As a final test, the original 1-10,000-scale 1852 chart was reduced in scale to 1-125,000, the scale of the modern U.S.G.S. quadrangle, and overlaid on the modern map. The shoreline of the 1852 chart was marked as being below Sloat Boulevard and directly off Fleishhacker Pool. From this point a survey zone that extended 1/4 mile, with the estimated wreck site in the middle, was selected.

The final problem was the position of the wreck in relation to the shoreline at low tide. The log entry for Nov. 25-26 notes that continuous breakers swept the ship, carrying away a boat, until the ship was fast aground. Such wave action would carry Lawrence higher up on the beach than her estimated 9-foot draft, particularly at high tide. The log notes that the ship lay in "3½ feet of water, with 2½ feet of water in the hold." If this was the case, the ship

CALIFORNIA

FROM

POINT LOBOS

SOUTHWARD

U.S. Coast Survey

A.D. Bache Supt.

1852

382

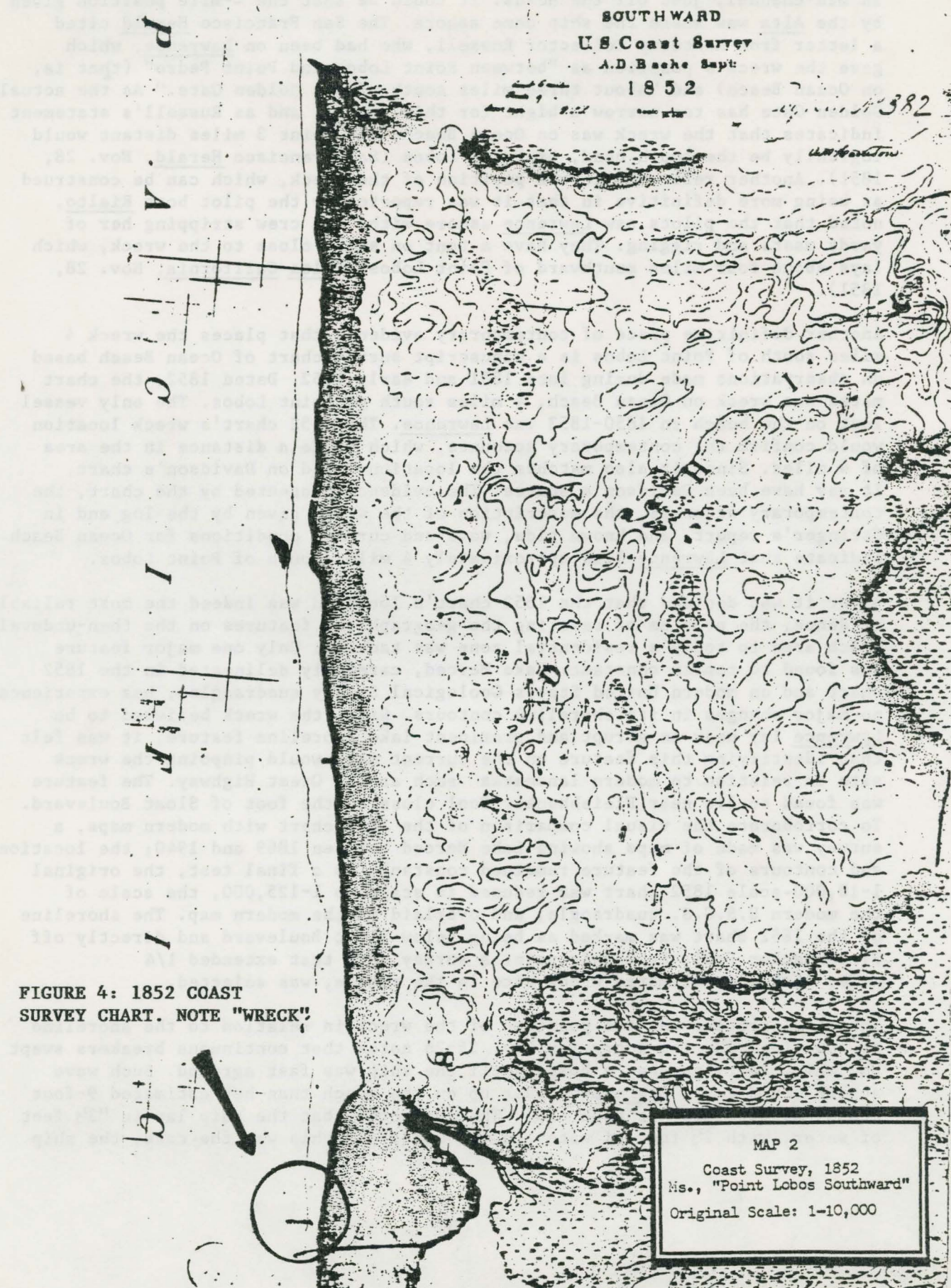


FIGURE 4: 1852 COAST
SURVEY CHART. NOTE "WRECK"

MAP 2
Coast Survey, 1852
Ms., "Point Lobos Southward"
Original Scale: 1-10,000

would be dry at low tide. Ottinger, in reporting actions taken after the wreck, noted "We have hove the vessel well up on the beach," indicating that Lawrence's final position was higher than when she first went ashore. With this information, it was determined that the wreck would lie within the littoral zone of the present beach and may be "high and dry" at extreme low tides. Sand attrition and a loss of beach has been suggested for this area, but a comparison of coast survey charts and maps since 1851 produced no evidence of major change (Olmsted and Olmsted, 1979:13).

An unknown, however, is the seasonal widening of the beach caused by winter buildup of sand near this location. If Lawrence wrecked where the beach was seasonally wider, and since the difference in widths can be as much as 100 feet, the vessel could lie in deeper water, perhaps even outside the surf zone, during the spring and summer. With this in mind, a survey zone was established that ran from the beach level at extreme high tide to exactly 1/4 mile offshore from the mean low tide mark. This zone, it was felt, would include all likely and unlikely (deep water) locations of the wreck. The quarter-mile zone also conformed to the boundaries of the Golden Gate National Recreation Area.

SURVEY DESIGN

The fieldwork planned and executed during this project was designed to determine the presence of ferrous cultural material within a designated area of Golden Gate National Recreation Area. The area selected for this Phase I reconnaissance survey was chosen because it represented the highest probability location of the remains of a specific historical vessel -- C.W. Lawrence.

As originally conceived, the survey would not only locate possible remains of Lawrence, but would also generate a comprehensive historical cultural resource survey of a discrete block of the Recreation Area. The latter objective would be useful to meet management directives to inventory cultural resources under federal jurisdiction.

This survey is what is commonly termed a Phase I survey, which is performed to answer the question of whether cultural material exists in an area or not. The most efficient technique for determining the location of cultural materials in most situations is to employ remote-sensing instrumentation. In the case of historical shipwreck materials, which was the intent of this survey, the magnetometer is generally the primary survey instrument, particularly when remains are likely to be buried beneath the seabed, a common occurrence with historic-period shipwrecks.

The magnetometer is a sophisticated electronic instrument that is capable of detecting changes in the earth's magnetic field. The magnetometer used on this survey was a proton-precession type, which uses the shift of protons in a liquid contained in the sensor to measure the earth's magnetic field at that point. The sensor is cable-tethered and towed behind the survey boat.

The magnetometer is usually set to a sample rate of once-per-second for shipwreck surveys. The magnetic field is measured in gammas, and the reading is displayed as a five-digit number and simultaneously recorded on an analog strip chart recorder, which gives a permanent, continuous record.

Local disturbances in the earth's field are called anomalies. Anomalies of interest in shipwreck surveys are usually produced by ferrous material, which can cause positive or negative deflections from the ambient magnetic field. The size of the deflection is related to the size of the mass of the object detected, however, the reading drops off as a cube of the distance that the sensor is from the object.

This characteristic is important for the design of shipwreck surveys. A block format is usually the most convenient for insuring complete coverage of an area. The area is crossed in a series of parallel transects, the spacing of which is determined by the target mass. Other researchers (Clausen and Arnold 1976) have determined that a colonial-period shipwreck could be detected using a 50-meter (164 feet) lane spacing. At the farthest distance (25 meters) a 1-ton mass of iron would give about a 2-3 gamma reading. Recent shipwreck survey work by the Submerged Cultural Resources Unit has used a 30-meter lane spacing (Murphy 1980, 1984) to reduce the chance of missing vessel remains containing small quantities of iron. At this lane spacing, a 1-ton mass would

give a minimum reading of between 20 and 30 gammas, and 1,000 lbs. would register about half that. Principal ferrous materials likely to be associated with the remains of Lawrence are anchors, iron ballast, chain, hull fasteners, rigging, fittings and armament, principally shot. The gun tubes were almost certainly removed during salvage operations. Because detailed salvage records have not yet been located, the closer lane spacing was chosen. Should Lawrence be broken up, or should there be other smaller vessels in the survey area, maximum practical reconnaissance survey resolution was desired.

Survey vessel positioning was critical to meeting the dual purposes of ensuring complete coverage and being able to relocate target areas for future evaluation. Fiscal and temporal constraints precluded the use of electronic positioning. Optical positioning that was based on triangulation from two shore-based transits in radio communication with the survey boat was chosen. Optical systems utilizing transits or theodolites have been used successfully for some time (Cockrell et al 1974, Clausen and Arnold 1976). Position location is determined by the use of a dual transit or a combination of transits and shore-or-water-based ranges. Magnetometer readings are interpolated between the position fixes, which are event-marked on the chart readout tape of the sensing instrument. The problem with optical systems are: relatively large errors are possible, because few blocks can be surveyed between instrument relocations; the system is operable only in times of adequate visibility, and there is usually a delay in post-plotting the actual vessel track, preventing recognition of voids in the survey area until after data reduction. Optical surveys are impractical for all but small near-shore areas.

Optical systems require a method for ensuring proper lane spacing and complete coverage. This usually means shore or water ranges, or the placement of buoys to guide the vessel pilot.

The 1983 Phase I survey at Golden Gate was designed to sufficiently cover a $\frac{1}{2}$ -square-mile area and produce anomaly intensities and positions sufficiently accurate to begin Phase II in-water evaluation. The plan was to establish a 600-yard base line (the survey was carried out in English measurement), which would encompass the primary target area. A transit would be stationed at each end of the base line to turn angles from the line to the survey vessel. Angles would be turned upon radio command from the boat, and they would either be taken on the boat itself or on a buoy thrown to indicate an anomaly of interest. The system for maintaining straight, properly spaced, parallel survey transects was to lay alternate-colored buoys perpendicular to the transit stations 30 yards apart out to a distance of $\frac{1}{4}$ mile. These buoys would be placed by the survey boat, with the spacing maintained by towing a buoy on a 30-yard line tied to the stern. As the towed buoy lined up with the last buoy laid, the next would be dropped. The buoys would give the boat pilot a steering target to line up on, which would allow him to hold a steady course the length of the survey block parallel to shore.

Range poles would be placed every 100 yards perpendicular to the base line on shore. When the vessel passed a set of range poles during a survey run, the event marker on the magnetometer chart readout would be activated when the range poles aligned. This would give a starting, ending, and five mid-run positions for each transect. Periodic triangulated shot points would be called

for by the archeologist aboard the vessel to give additional accurate positions. Buoys dropped on anomalies of interest would also be triangulated. Anomaly buoys would be of a different color than the lane-spacing buoys and would be consecutively numbered so that divers examining the anomaly could record the number of the buoy, which would coordinate with the proper set of angles.

Diving operations were to be carried out concurrently with the survey. Divers would execute visual circle search in the area of each anomaly buoy. If the results were negative, an underwater metal detector would be deployed with hand-fanning on positive detector contacts. There was no mechanical excavation equipment available, so test excavation was to follow as a separate phase of field operations.

A second task was also planned. Magnetic survey of the beach and surf area were to be done, if time allowed. This would serve as a contingency plan, should the weather render offshore survey impossible. The historical documentation indicates a good possibility for locating intact portions of Lawrence in or near the surf zone. There are examples of intact ship structure buried in the beach on the California coast. Magnetic survey of the beach would be done with the same magnetometer but with a hand-carried terrestrial sensor. Positioning would be done by tying into the base line on shore and laying a tape from known points to mark sample intervals.

SURVEY METHODOLOGY

Field operations were conducted on Oct. 24 through 28, 1983. A briefing was held for park and project personnel. The 600-yard base line and 100-yard range positions were established.

Offshore operations were cancelled on Oct. 25 due to heavy fog conditions. However, beach and surf areas were surveyed with the terrestrial sensor. The beach survey blocks were in 200-foot lengths. They were established by turning a right angle from the southern transit position and laying a tape. Lanes were marked every 10 feet by wooden stakes. A second tape was laid perpendicular to the first (parallel to the base line) and magnetometer readings were taken every 10 feet for 200 feet. The transit was used to ensure the lanes were laid straight. The tape was moved over for each lane. After completion of the first block the sample interval was increased to 15 feet.

Offshore survey operations were begun on Oct. 26. The survey vessel was a 41-foot aluminum U.S. Coast Guard vessel. Two members of the local press and videographers from Channel 5 accompanied the archeologists aboard the vessel.

The proposed survey methodology had to be revised upon reaching the survey area. Northwest ocean swells 5-8 feet in height every 12-14 seconds were breaking in the target area of the survey zone. Instead of running survey transects through a buoy grid parallel to shore on 30-yard lane spacing as planned, lanes were run roughly perpendicular to the shore. A transit operator was on each end of the base line and in radio communication with the survey vessel. At the beginning and end of survey lanes, an angle was called for by the magnetometer operator. The transit operators who were tracking the survey vessel read the angle turned from the 600-yard-surveyed base line at the proper time. Four buoys were deployed on a target area that potentially represents the remains of a wrecked vessel. These buoys were triangulated in by the transit operators. No diving was done during the project to determine if cultural remains were visible in this area.

Work on the second day of survey (Thursday, Oct. 27) was terminated early when we observed ocean swells breaking in the previously buoyed target area. Due to the conditions, survey and diving operations were aborted. The remainder of the day was spent in terrestrial survey of the beach in the survey zone.

Friday, the last day of the survey, offshore activities were terminated due to heavy fog conditions. Although survey vessel operations could have been carried out, no positioning of the anomaly targets or area surveyed could be accomplished with the optical system. Friday afternoon was spent plotting the survey data collected on Wednesday.

SURVEY RESULTS

An area of about 700 yards by 700 yards was surveyed by magnetometer. The area extended out from 400-500 to 1,000-1,100 yards offshore. One magnetic anomaly target area was delineated 450-500 yards offshore. This anomaly is a broad bipolar anomaly with an intensity of +300 gammas and -225 gammas. The depth of water was 20-25 feet measured by the vessel fathometer. This anomaly represents an estimated mass of at least 1 ton. The distance offshore makes it an improbable candidate for remains of the three wrecks known to be in the area. This area surveyed began near what would have been the western offshore boundary of the desired survey zone thought to contain the remains of C.W. Lawrence. Due to the heavy surf conditions, most of the surveyed area was in California waters outside the boundary of GGNRA.

Although one promising anomaly target area was located, it should be noted that a magnetic anomaly represents only the presence of ferrous material of unknown age and origin. The presence or absence of significant cultural remains can only be established by on-site evaluation. If the remains are buried, then test excavations are necessary for this determination. Concurrent diving operations should be carried out with reconnaissance-level magnetometer survey whenever possible to ascertain if identifiable remains project above the bottom sediments.

The presence of significant shipwreck remains in the beach and surf zone of the park has already been determined. The magnetic survey of the beach zone in the survey area was begun during the week and completed by GGNRA personnel. The beach survey data has been post-plotted and contoured. Although ferrous material is indicated by the contour configuration, confirmation can only come from further on-site investigations.

Observations for Future Work:

The coasts within GGNRA that have an open Pacific exposure will be difficult to survey for submerged cultural resources. Electronic positioning is the preferred mode because it is not dependent on human visibility. Electronic positioning is costly and becomes cost-effective only if large areas are to be surveyed. If small-scale optical positioning surveys are contemplated in the future, they must occur when weather and ocean conditions are optimal.

The breaker zone poses a formidable problem to remote sensing. The area of highest probability of shipwreck occurrence is in the water depths that are often covered by breakers. Any survey should be planned during seasons of the year when the swells and breakers are likely to be minimal. There may still be a portion of the park waters between the areas that can be waded from shore and those surveyable from a vessel that will not be covered unless techniques are developed and tested for this high-probability area.

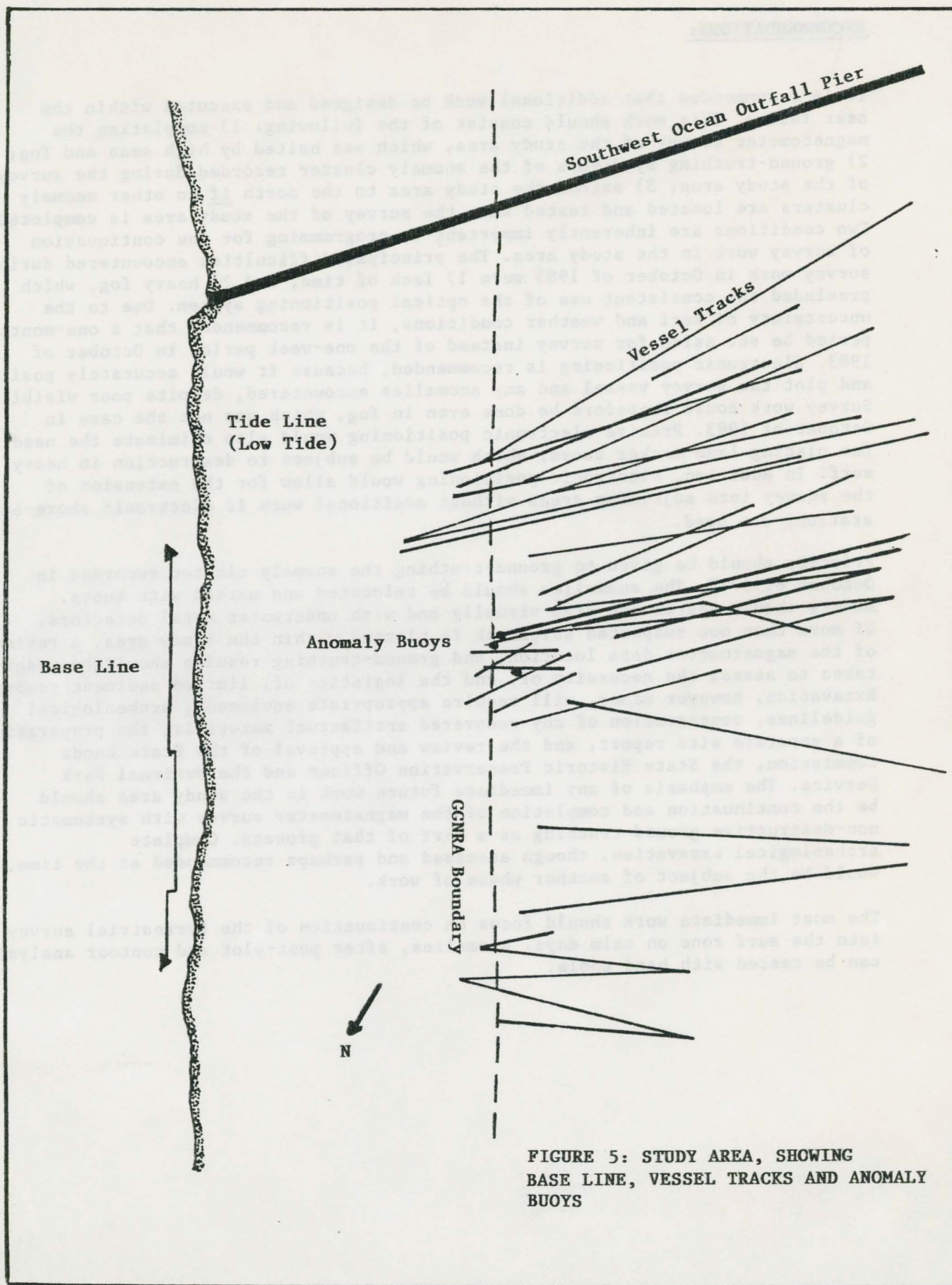


FIGURE 5: STUDY AREA, SHOWING
BASE LINE, VESSEL TRACKS AND ANOMALY
BUOYS

RECOMMENDATIONS:

It is recommended that additional work be designed and executed within the near future. This work should consist of the following: 1) completing the magnetometer survey of the study area, which was halted by high seas and fog; 2) ground-truthing by divers of the anomaly cluster recorded during the survey of the study area; 3) extend the study area to the north if no other anomaly clusters are located and tested when the survey of the study area is completed. Two conditions are inherently important in programming for the continuation of survey work in the study area. The principal difficulties encountered during survey work in October of 1983 were 1) lack of time, and 2) heavy fog, which precluded the consistent use of the optical positioning system. Due to the uncertainty of surf and weather conditions, it is recommended that a one-month period be set aside for survey instead of the one-week period in October of 1983. Electronic positioning is recommended, because it would accurately position and plot the survey vessel and any anomalies encountered, despite poor visibility. Survey work could therefore be done even in fog, which was not the case in October of 1983. Precise electronic positioning would also eliminate the need for placing lane-marker buoys, which would be subject to destruction in heavy surf. In addition, electronic positioning would allow for the extension of the survey into adjoining areas without additional work if electronic shore-based stations are used.

Priority should be given to ground-truthing the anomaly cluster recorded in October of 1983. The anomalies should be relocated and marked with buoys. Divers should search the area visually and with underwater metal detectors. If more than one suspected shipwreck is plotted within the study area, a review of the magnetometer data location, and ground-truthing results should be undertaken to assess the necessity of, and the logistics of, limited sediment removal. Excavation, however minor, will require appropriate equipment, archeological guidelines, conservation of any recovered artifactual materials, the preparation of a separate site report, and the review and approval of the State Lands Commission, the State Historic Preservation Officer and the National Park Service. The emphasis of any immediate future work in the study area should be the continuation and completion of the magnetometer survey with systematic non-destructive ground-truthing as a part of that process. Complete archeological excavation, though assessed and perhaps recommended at the time, would be the subject of another phase of work.

The most immediate work should focus on continuation of the terrestrial survey into the surf zone on calm days. Anomalies, after post-plot and contour analysis, can be tested with hand tools.

CONCLUSION:

The construction of a reproduction of Lawrence by the Nautical Heritage Museum at Dana Point as the sail training ship Californian helped initiate the first phase maritime archeological survey outlined in this report to locate the remains of Lawrence. As a result, much has been learned about a significant vessel that previously occupied a shadowy niche in the maritime history of the region. New historical research was performed that unearthed forgotten details of Lawrence and her career. The maritime archeological project also provided a forum for researching the history of the ship. Just as important was the identification of the area of Lawrence's wreck and the establishment of diagnostic features that will positively allow for the discrimination of Lawrence remains. Despite difficulties inherent with the shallow-water, heavy-surf, high-energy site of Lawrence's loss, and which were aggravated by unpredictable heavy fog, a large portion of the study area was surveyed, resulting in the location of a series of promising anomalies. If these anomalies are tested and indicate a shipwreck, analysis can be undertaken to see whether Lawrence has been found.

A significant block of work was completed. Since then, recommendations for additional work have been discussed and are presented in this report. Considerable media attention resulted from the survey as an additional benefit, fostering a better public understanding and appreciation of maritime archeology, of the significance of Lawrence and the heir of Lawrence's traditions, Californian. It is anticipated that the next phase of work will result in the location of Lawrence's remains, if the remainder of the study area is surveyed and appropriate anomalies are tested. The precise location of Lawrence will afford new opportunities to study, analyze, and present the story of Lawrence. Her archeological remains will yield previously unavailable information about her construction, and through associated material culture will offer additional interpretations of life on board and her role as a revenue cutter. The saga of Lawrence and her involvement in the California Gold Rush will add another significant chapter in the history of the Revenue Marine and the maritime history of the United States. The joint efforts of the Nautical Heritage Museum and the National Park Service to achieve these goals have been thus far successful. They represent the melding of past and present in the identification of Lawrence remains and the rebirth of the ship as Californian.

REFERENCES CITED:

Manuscripts:

National Archives, Washington, D.C.

Record Group 56, "General Records of the Department of the Treasury"
General Records of the Office of the Secretary, 1789-1968,
"Correspondence"

Record Group 26, "Records of the United States Coast Guard" - Records
of the Revenue Cutter Service, 1790-1915.

"Logbook, C.W. Lawrence" (October 1848-November 1851)

"Muster Rolls, C.W. Lawrence"

"Service Records of Officers"

"Correspondence, Collectors of the Port to the Secretary of the
Treasury"

"Correspondence--Financial"

Bancroft Library, University of California, Berkeley

Manuscript Shipwreck Chart in the George Davidson Papers

California State Lands Commission, Sacramento

Chart, "A Map of Part of the Coast of California From Point Lobos Southward
....1852"

Government Documents:

"Annual Report of the Secretary of the Treasury, 1848" House Ex. Doc. 33rd
Congress, 2nd Session.

Newspapers:

San Francisco Daily Alta California

San Francisco Daily Evening Bulletin

San Francisco Examiner

San Francisco Herald

San Francisco Daily Morning Call

San Francisco Prices Current and Shipping List

Washington, D.C. Daily National Intelligencer

Published Accounts and Secondary Sources:

Anonymous

1881

An Abridged Account of Services Rendered by Captain Douglass
Ottinger, U.S. Revenue Marine . (no publication data)

- Bloomfield, Howard V.L.
1966 The Compact History of the United States Coast Guard. (Hawthorn Books, New York)
- Butler, David F.
1971 United States Firearms, The First Century, 1776-1875. (Winchester Press, New York)
- Chappelle, Howard I.
1935 The History of American Sailing Ships. (W.W. Norton, New York)
- Clausen, Carl J. and J. Barto Arnold III
1976 The Magnetometer and Underwater Archeology. International Journal of Nautical Archeology and Underwater Exploration 5(2): 158-165
- Cochrell, W.A., Larry Murphy, Ellen Murphy, Bill Spencer
1974 Survey of Ft. Jefferson National Monument Preliminary Report. Ms on file Division of Archives, History Records management, Underwater Archeological Research Section, Tallahassee.
- Easby-Smith, Mrs. Wilhelmine M.
1913 Personal Recollections of Early Washington and a Sketch of the Life of Captain William Easby. Association of the Oldest Inhabitants of the District of Columbia, Washington, D.C.
- Foreman, Grant
1937 The Adventures of James Collier: First Collector of the Port of San Francisco. (Black Cat Press, Chicago).
- Froncek, Thomas, Ed.
1977 An Illustrated History of the City of Washington. Junior League of Washington and Alfred A. Knopf, New York.
- Gluckman, Arcadi
1965 Identifying Old U.S. Muskets, Rifles and Carbines. (Bonanza Books, New York).
- Hansen, Gladys
1980 San Francisco Almanac (Presidio Press, San Rafael).
- Harlow, Neal
1982 California Conquered: War and Peace on the Pacific, 1846-1850 (University of California Press, Berkeley and Los Angeles).
- Murphy, Larry
1980 Survey Methodology: Specific Site Survey. Biscayne National Monument, 1980. ms. on file at Southwest Cultural Resources Center, Santa Fe.

- Murphy, Larry
1983 Phase I Remote Sensing Survey Design. In A Shipwreck Survey at Point Reyes National Seashore and Point Reyes-Farallon Islands National Marine Sanctuary: Phase I Reconnaissance Survey. Edited by Larry Murphy, National Park Service Submerged Cultural Resources Unit, Publication, Santa Fe (In Press).
- Olmsted, Roger and Nancy Olmsted
1979 Ocean Beach Study: A Survey of Historic Maps and Photographs (Wastewater Management Program, San Francisco).
- Rasmussen, Louis J.
1967 San Francisco Ship Passenger Lists, Volume III. (San Francisco Historic Records, Colma, California)
- Todd, Fredrick P.
1974 American Military Equipage 1851-1872, Volumes I and II. the Company of Military Historians, Providence.
- United States Army
1861 The Ordnance Manual for the Use of the Officers of the United States Army. J.B. Lippincott, Pennsylvania.
- United States Department of Commerce
1871 Merchant Vessels of the United States....
-
- 1893 Merchant Vessels of the United States....

APPENDIX ONE: SPECIFICATIONS FOR SIX SCHOONERS FOR THE U.S. REVENUE SERVICE
UNITED STATES TREASURY DEPARTMENT, SEPTEMBER 6, 1848

The vessels for which these specifications were drawn up did not include Lawrence. The specifications are reproduced for size data and to indicate the nature and quality of materials desired for Revenue Marine vessels. Dating to within two weeks of Lawrence's launching, these specifications most probably illustrate standard Revenue Marine specifications for that time and hence similar methods of construction and materials would have been employed in building Lawrence.

SPECIFICATIONS

The keels of white oak, to side ten inches, and to be twelve inches deep below the rabbet. The whole of the floor timbers to be of white oak, and their shape to be of natural growth.

Kelsons, of same materials, ten by twelve inches. Every alternate floor timber to be bolted with copper bolts three-quarters of one inch thick. The remaining floor timbers to be fastened through the keel and kelson with copper bolts seven-eighths of one inch thick.

Deadwood, of white oak; Apron, Knight Heads, and Transoms, of live oak, and both to be fully and securely fastened with copper bolts seven-eighths of one inch thick.

Frames of white oak, to be placed two feet apart from centre, to mould twelve inches at the heel and six inches at the head, and to side eight inches. Each futtock of same materials as floors; the shape to be of natural growth, and to scarf not less than four feet. Top timbers to be of live oak, locust, and cedar, and the frame to be solid from aft as far as the poop deck extends, and forward from the fore rigging. Bulwarks to be solid forward of the free rigging, and to be planked inside and out with two-inch white oak plank. The remaining portion of the bulwarks to be single, and of two-inch white pine plank, and the whole of the deck, bulwarks, wales &c to be plugged.

Stanchions to be of locust, perfectly clean and sound, and to side seven inches.

The bottom to be planked with the best white oak plank, three inches thick. Wales of like materials, four inches thick, and to diminish to the thickness of the bottom. The bottom to be fastened with two composition spikes, seven inches long, and two locust treenails in each frame, and to be butt bolted throughout with copper bolts five-eighths of one inch thick, and four strakes on the bilge to be fastened with copper bolts three-quarters of one inch thick, and not less than four feet apart.

The ceiling to be of yellow pine, two inches thick, except four bilge strakes, which are to be of oak, four inches thick, and to be fastened with two spikes in each frame.

Clamps to be in two strakes of yellow pine, four inches thick and twelve inches wide, and each strake to scarf six feet on each side, with two bolts three-quarters of one inch thick in each frame and strake.

Deck frame to be of yellow pine; beams to mould six inches on the ends and nine inches in the centres, and to side not less than ten inches, with carlines at proper intervals. To be thoroughly secured with lodge and bosom knees, and hanging knees under each alternate beam. The whole to be thoroughly fastened, and no root knees will be admitted. Waterways to be of white pine, nine by thirteen inches, and to be thoroughly fastened to the beams and side.

The main deck to be of white pine, free from knots and shakes, three inches thick and six inches wide, except three strakes on each side, nearest the waterways, which will be of the same materials and width, but four inches in thickness, which three strakes will be let into the beams and carlines, and bolted through the side and waterways with bolts five-eighths of one inch thick, and not less than four feet apart. Main deck to be fastened with two six-inch iron spikes in each beam and strake, and one in each carline.

Hatch and mast combings to be of mahogany, covered with composition plates on the top and corners.

Plank shear and main rail of oak or yellow pine four inches thick.

Hammock rail and nettings to be finished in the usual manner. Full poop deck, flush with the main rail, and with a cockpit aft. Beams of poop deck of white pine, and deck of like materials two and one-half inches in thickness; and the whole to be securely knee's and fastened to the frame.

Forecastle deck to extend to the bowsprit bits. Berth deck to be of white ash, and laid in hatches, and furnished with all necessary fastenings. The copper fastenings of the bottom to be carried one foot above the load line. The whole to be well caulked, paid and scraped inside and out; the bottom to be planed, and all the wood and iron work to be covered with three coats of best paint. The bottom first to be covered with patent felt, and coppered to the load line with pure sheathing copper, properly distributed, from eighteen to twenty-eight ounces to the square foot. To furnish all the spars of every description,

fully fitted, and placed in their proper positions. The lower masts to be of white pine, and the residue of the spars from spruce, free from knots, and of such dimensions as may be hereafter given. To furnish all the iron, brass, and plumber's work (including two patent water closets) in any way connected with the hull, spars, blocks, and rigging, with the exception of anchors, chains, water tanks, and armament. To furnish and fit up on board of each vessel two copper pumps, similar to those manufactured by A.J. Allaire & Co., of New York, with two complete sets of gear, and extra boxes. To furnish all the blocks, with iron work complete. All blocks of greater dimensions than seven inches to be plank blocks, and provided with friction rollers; and all of less size with iron pins and bushes. To furnish a capstan, steering apparatus, and six patent side lights of the best description. To furnish the materials, fastenings, &c usual on board of revenue vessels, and execute every description of work usually denominated joiner's work, and in any manner connected with the vessels, except that of the cabin, wardroom, and steerage below the deck. In fact, furnishing all the materials necessary, execute all the before mentioned work in a faithful manner, and to the satisfaction of the superintendent; and deliver the vessels afloat in a safe harbor on the Atlantic, fully finished, furnished, and equipped, with the exception of sails, rigging, chains, anchors, water tanks, armament, camboose, nautical instruments, cabin and wardroom furniture, boats, and joiner's work of cabin, wardroom, and steerage....

JOINER'S WORK

To furnish all the materials, fastenings, &c of the very best description, and execute all the joiner's work connected with the cabin, wardroom, and steerage below the deck. The berths to be open fronts, with drawers underneath. The berth and drawer fronts, pilasters, caps, &c, in cabin and wardroom, to be of black walnut, and the residue to be of white pine, well seasoned, and perfectly free from knots. All the pine wood work of the cabin and wardroom to be covered with three coats of best English white-lead; the last two coats to be well pumiced down, and all the work covered with three coats of copal varnish. The steerage to be painted with three coats of white-lead. Two berths in the cabin, four in the wardroom, and three in the steerage. To furnish a mahogany extension table for the cabin, and one for the wardroom. To provide all such pantrys, lockers, &c as are usual on board of revenue vessels. Also companion ladders of mahogany....

BOATS

To furnish all the materials, construct, and deliver at such port or ports on the Atlantic coast, four New London Whale-boats, twenty-four feet long, and four square stern cutters of the same length....Said boats must be built of the very best white oak and cedar. The gunwales without scarf, and the timbers of natural crook or bent in. To be copper fastened throughout, and furnished with two sets of oars, fitted complete; two boat-hooks, yoke and oarlocks of brass.

The whole to be finished in the best manner, and covered with three coats of lead-colored paint, and in all respects satisfactory to the superintendent. Payment will be made on delivery.

SAILMAKER'S WORK

To furnish the best materials of bolt rope, twine, composition thimbles, reef-points, &c. Infact, to furnish all other materials except the cloth, and to make all the sails usual on board of a revenue vessel carrying a foretopsail and topgallant sail, with hatch tarpaulins, quarter, main, and forecastle deck awnings. Awnings for two quarter boats; mast coats, forty hammocks, and twenty cloth's bags; binnacle and wheel covers; and execute all work denominated sailmaker's work; and deliver the same at such port on the Atlantic coast....Payment will be made on delivery.

All the work to be executed in such manner as shall be directed by the superintendent. But no departure from the original plans and models will be permitted unless the previous sanction of this Department is obtained; and no extra bills of any nature whatever, beyond the amount of the contracts, will be allowed.

Offers will be received for the shipwright's, boatbuilder's, joiner's, or carpenter's work for each vessel, separately or for the whole, provided sufficient sureties are given.

McCLINTOCK YOUNG

Acting Secretary of the Treasury

(Washington Daily National Intelligencer), Sept. 6, 1848.

APPENDIX TWO: ARMAMENT

The armament of Lawrence is referred to throughout the logbook as well as in Revenue Marine correspondence and a contemporary newspaper account. Lawrence was pierced for ten guns; according to the Washington Daily National Intelligencer of October 30, 1848, she was originally armed with five cannon; "one long 18 pounder, two medium 32's and two 6's." The 18-pounder is never mentioned again but at some point was removed, for in October of 1851 Lawrence carried six guns; two medium 32's, two 6's, and two 12's. Lawrence additionally carried many small arms and edged weapons. The following listing of armament and weapons was drawn from sources researched by Master Chief William Wells, United States Coast Guard Headquarters, Washington, D.C. who graciously shared his research.

HEAVY ARMAMENT:

Cannon:	2 medium 32-pounders
	2 6-pounders on carriages
	1 18-pounder on carriage (later removed)
	2 12-pounders on carriages (added later)

Accessories:	2 Rammers and Sponges*
	2 Worms and Ladles*
	4 Crowbars*
	4 Shod Handspikes*
	2 Tompions*
	2 Brass Aprons*
	2 Mallets and Spikes*
	2 Boring Bits*
	2 Pruning Wires*
	2 Cannon Locks*
	100 Cannon Primers

Shot and Shell:	200 32-lb. Shot
	100 32-lb. Grape Shot
	100 32-lb. Canister Shot
	100 6-lb. Shot
	100 6-lb. Grape Shot
	100 6-lb. Canister Shot
	50 32-lb. Shells

(*Note: for 32-pounders)

WEAPONS:

- 12 Model 1848 Colt Dragoon Pistols (.44 caliber)
- 20 Percussion Pistols (Jenks "Muleers" .52 caliber)
- 20 Percussion Carbines with Powder Flasks, Wipers
- Bullet Moulds
- 3000 Percussion Caps for Carbines
- 20 Swords (Model 1841 Naval Cutlass)
- 20 Boarding Pikes (10" blades, 8' handles, stamped "USR")

APPENDIX THREE: SPECIFICATIONS FOR RATIONS, 1849

Foodstuffs and containers may be associated with the archeological remains of Lawrence. The following items were listed by collector of the Port of San Francisco James Collier, asking for bids to supply everything listed "for the term of one year, from the 1st Day of December, 1849." The invitation for bids was published in the San Francisco Daily Alta California of November 15, 1849.

Beef, Pork, Flour, Rice, Raisins or Dried Fruit, Pickles,
or Cranberries, Biscuit, Sugar, Tea, Coffee, Cocoa, Butter,
Cheese, Beans, Molasses, Vinegar.

One pound of beef was served to each man on Sunday, Tuesday, Thursday and Friday; Pork was served on Monday, Wednesday and Saturday. One-half pound of flour was served on Sunday and Thursday, $\frac{1}{2}$ pound of rice was served on Tuesday and Friday. One-quarter pound of raisins or dried fruit was served on Sunday and Thursday; $\frac{1}{4}$ pound of pickles or cranberries was served on Wednesday and Saturday. Fourteen ounces of biscuit were served each day along with 2 ounces of sugar, 1 ounce each of coffee and cocoa, and $\frac{1}{4}$ ounce of tea. Two ounces each of butter and cheese were served on Tuesday and Friday. A half-pint of molasses was doled out on Friday, and a half pint of vinegar was doled out on Saturday. Additionally, one gallon of water per day was issued to each man.

APPENDIX FOUR: LAUNCHING SHIPS AT EASBY'S SHIPYARD IN THE 1840's

The following account was related by Easby's daughter Wilhelmine on June 4, 1913, when she addressed the Association of the Oldest Inhabitants of the District of Columbia:

LAUNCHINGS.

The gala days at the Point were when a ship was launched. As these were generally built for the Government, cabinet officers, officials of high rank, and frequently foreign diplomats, were among the guests.

Every detail for a launching must be carefully prepared, that no hitch nor blunder may occur, and the workmen waited with baited breath for the success of the launching, for in these old times they were greatly interested in their work, and became really attached to their construction as it grew into graceful proportions.

It was a beautiful and exciting scene to watch the large vessel start on the ways and to listen to the strokes of the hammers that loosed the wedges, to see her gradually gathering impetus as she glided gracefully down into the water upon whose bosom she was to spend her life and beneath which sooner or later she would find her grave.

Then a collation spread in one of the ship lofts was enjoyed by guests and employees.

I well remember the launchings of the revenue cutters Forward, in 1842 or 1843, and Lawrence, in 1847 [sic]. The Forward was in commission for more than a quarter of a century, and may still be in existence. My brother, Doctor James Thompson Overstreet, whose father, a Congressman from South Carolina, was my mother's first husband, was appointed Surgeon of the Lawrence, which sailed to California. While on her way the gold was discovered. Doctor Overstreet was accidentally killed in Los Angeles in 1853.

